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AND

ALLIED METHODS OF TREATMENT

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AT THE

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IN CONNECTION WITH THE WEST-END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, PARALYSIS AND EPILEPSY, 73, WELBECK STREET, LONDON, W.

BY

HERBERT TIBBITS, M.D.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS IN EDINBURGH
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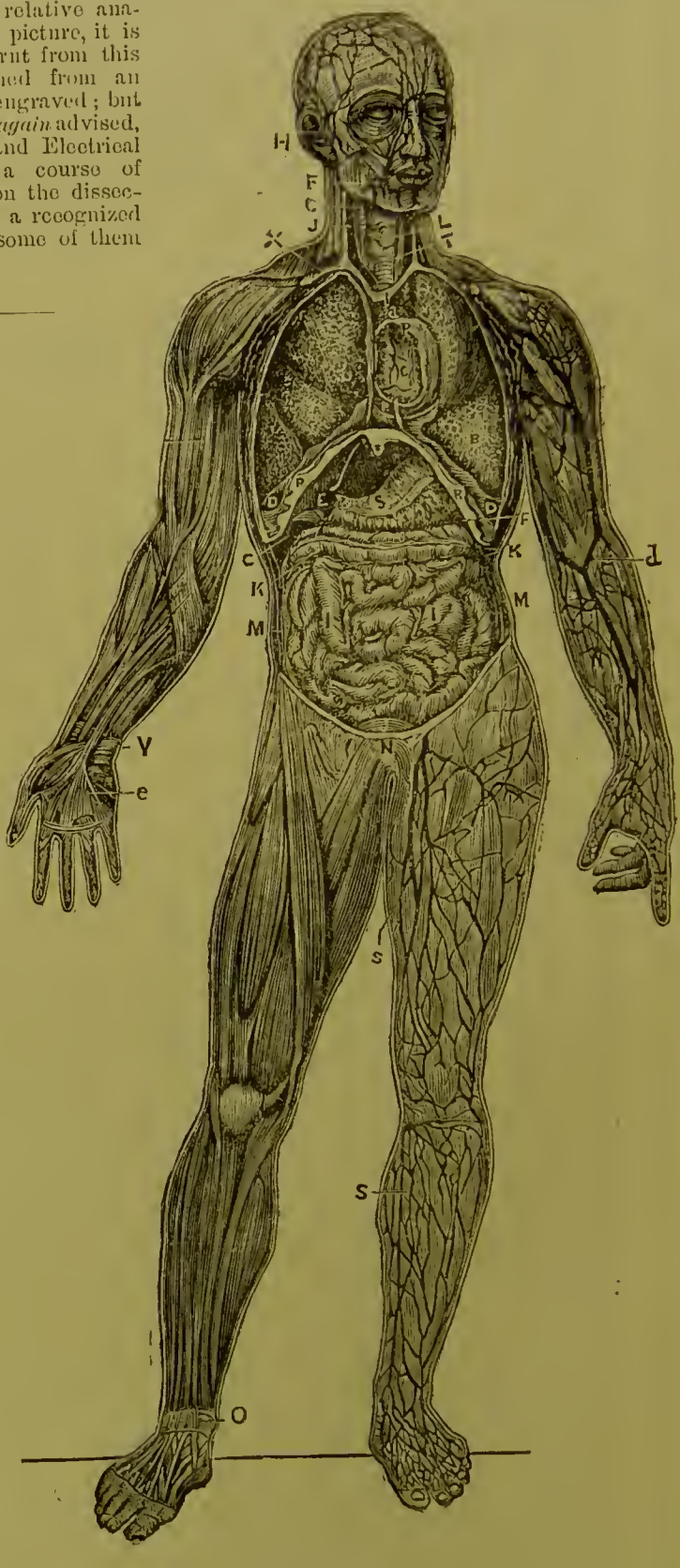
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THE HUMAN BODY.

This Figure exhibits a Dissection of the Body, showing upon the right limbs the muscles, and upon the head and left limbs the superficial arteries and veins. The chest and abdomen are laid open to show their contained organs. The student is recommended to study the figure *through a good magnifying glass*, and to study it very carefully and fully, so that the *relative position* of the various organs of the body may be firmly impressed upon the memory. As far as a general idea of relative anatomy may be learnt from a picture, it is believed that it may be learnt from this one, as it was photographed from an actual dissection, and then engraved; but as the author *has again and again* advised, *all* Students of Massage and Electrical Treatment should attend a course of practical demonstration upon the dissection of the Human Body at a recognized Medical School, as indeed some of them are now doing.

A—The right lung.
B—The left lung.
c—The heart.
D, D—The diaphragm.
E—The liver.
F—The spleen.
G—The gall-bladder.
I, I—The small intestine.
J—The bladder.
K, K—The colon or large intestine.
L—The larynx, or organ of voice.
M—Cut muscles of the abdomen.
N—The pubes.
P—The pericardium.
S—The stomach.
T—The trachea, or wind-pipe.
*—The tip of the sternum.
d—The arch of the aorta.
X—Subclavian vein.
C—Right carotid artery.
d—Superficial veins of the arm.
e—Palmar fascia.
F—Right facial artery.
i—Left innominate vein.
j—Right jugular vein.
O—Annular ligament of the ankle.
p.—Pulmonary artery.
s, s—Great saphenous vein.
H—Right temporal artery and vein.
V—The annular ligament of the wrist.



CONTENTS.

PREFATORY NOTE.

PRELIMINARY REMARKS.

IMPORTANCE OF THE LOCAL TREATMENT OF DISEASE BY MASSAGE AND OTHER METHODS, AS DISTINGUISHED FROM THE "*Exhibition of Drugs.*"

(*a*) *Its Principles as laid down by Weir Mitchell.*
(*b*) „ „ *other Authors.*
(*c*) *The Dose.*
(*d*) *Terms generally used to describe its Different Processes.*
(*e*) *The German System of Massage.*
(*f*) *Description of a complete Massage of the Body.*
(*g*) *Different forms of Massage Baths.*

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INHALATION.

ELECTRIZATION.

PHYSIOLOGY OF MASSAGE.

MASSAGE AND ELECTRIZATION.

RECAPITULATION.

GENERAL NERVOUS DISEASES.

(*a*) *Importance of immediate and adequate Treatment.*
(*b*) *Some considerations as to the Nervous System.*

1. The Brain.
2. The Vital Principle.

NEURASTHENIA OR NERVE EXHAUSTION.

Importance of Sleep.

1. Somnambulism.
2. Epilepsy.

General Examples of the Treatment of Neurasthenia and other Diseases.

Concluding Remarks.

POSTSCRIPTUM.

The Human Body.

(*a*) *The Circulation of the Blood and the Lymphatics and Absorbents.*
(*b*) *The Digestive Organs and the Process of Digestion.*

PREFATORY NOTE.

THE author is in cordial agreement with a leading article which appeared in the *Lancet* the other day: that "all who are connected either as physicians or surgeons with hospitals, or as employers of skilled nursing in private practice, must have been impressed by two striking facts which have arisen within the last ten years. The first of these is, that from social or economical causes large numbers of highly educated gentlewomen of the upper and upper middle classes have adopted the nursing of the sick as a definite calling, instead of remaining at home more or less unemployed; or if obliged to earn a livelihood, instead of entering some such uncongenial life as that of a governess; and the second is, that the social status of nurses collectively has been immensely raised and their individual influence much increased." As a consequence, certain methods of treatment which

it is not possible on account of the time they occupy for the medical practitioner to always carry out himself, may *now* be entrusted with confidence to specially trained and practised nurses, *acting under his supervision.* Medical Galvanism is undoubtedly one of these methods, Massage as undoubtedly another, and Medical Gymnastics as undoubtedly a third; and hence the foundation of our "School of Massage and Electricity," and the delivery of the Lectures an abstract of which is printed in the following pages, and which it is hoped may prove useful, not only to our own students, but also to others who may not have had the advantage of daily study and practice in hospitals devoted to those suffering from paralysis and other diseases of the nervous system; for although Massage is an art only to be acquired by prolonged tuition and practice, still some theoretical knowledge of its principles and of the benefit to be gained from its use should be more widely diffused than is the case at present.

These Lectures being delivered to nurses, have incorporated with them such anatomical and physiological knowledge as may be considered desirable. Their colloquial style has not been altered, and they are printed as spoken.

The first edition having been exhausted in six months, the author has carefully revised them, making such additions as he believed would render them more worthy of the favour with which they have been received; and, with this object, he has supplemented his own somewhat prolonged experience by considering with care every article and book upon Massage that has been published. *He has quoted from all the best of these;* and he would especially acknowledge his indebtedness to Weir Mitchell and Douglas Graham, in America; to Metzger, Mosengeil, Zabludowski, and especially Schreiber, on the Continent; and to Playfair and Mortimer Granville, in this country.

He has endeavoured to give direct reference to his quotations; but quoting from memory he may have failed sometimes: but to put it shortly, his design has been to cordially recognize all good work all over the world upon the subjects upon which he lectured; and *not* to arrogate to himself the position of *the* sole high priest of Massage.

Wimpole Street, W.
September 1888.

MASSAGE

AND

ALLIED METHODS OF TREATMENT.

AN ABSTRACT OF LECTURES.

You may perhaps recollect that in an introductory Lecture * to our present Session, I sought your attention (of course in that Lecture only), not so exclusively to the medical aspect of the methods of treatment taught at our School, as to the prospect held out of an honourable and remunerative career for educated women, possessing some aptitude for nursing.

At that time, the matter was somewhat in the nature of an experiment. Then we had about a dozen students; now we have many certificated Masseuses and Nurse-Electricians, and our School is an established success.

* "Medical Galvanism."—An Introductory Lecture delivered to Nurses and Masseuses, at the School of Massage and Electricity, in connection with the West-End Hospital for Diseases of the Nervous System, Paralysis and Epilepsy, Welbeck Street, London. Churchill: New Burlington Street.

I propose to take a rapid, but I hope useful, survey of our past six months' work.

You are of course aware that the treatment which we have so especially adopted—what may be called the "*local treatment*" of disease, as distinguished from mere physic drinking—has recently made much progress.* Regarded at first by the medical profession with aversion, it has gradually but surely made its way: and now the chief leading physicians and surgeons are numbered amongst its warmest advocates. Weir Mitchell, of Philadelphia, upon whose system ours is engrafted, writes as follows:—"I do not wish to be thought as putting forth anything very remarkable or original in treatment by rest, systematic feeding, and passive exercise. All of these have been used, but, as a rule, one or more without the others; and the plan of combining them does not seem to be generally understood."

It is the verdict of the medical profession, all over the world, that "although Mitchell's method was not new in the sense that its separate recommendations were made for the first time, it *was* new in the sense that these recommendations were, for the first time, combined."

* The other day Sir William Gull spoke as follows:—"Disease is not cured by drugs. How many doses of medicine did the Prince of Wales take when he was ill with typhoid fever? Not four. It is the power of nature that cures disease; and the duty of the medical man is—not to give drugs—but to assist Nature."

So spoke Sir William Gull. And Lord Coleridge, deciding a law case not long since, said:—"If you give a man drugs, you make him the arena of a conflict of opposing poisons."

To the Weir Mitchell treatment we add the various methods of Medical and Surgical Electrization, Ling's system of Medical Gymnastics (known as the "Swedish Movement Cure"), Dr. Mortimer Granville's Nerve Excitation, and the methods of Massage taught by Metzger, Mosengeil, and other well-known Continental authorities: and our hospital stands quite alone—I believe in Europe—in having associated with it a School attended by numerous students (and we have two who have journeyed from America) who are carefully and thoroughly trained, who attend daily to Massage, Electrize, and apply other methods of local treatment as directed by and under the supervision of the Medical and Surgical Staff, and who, at the end of their training, and after passing a written and practical examination, receive certificates that they are "*competent to apply Massage and Electricity under Medical Authority.*" *

The combined methods to which I have briefly referred are essential to the most successful treatment, not alone of all diseases of the Nervous System, such as Paralysis, Nervous Exhaustion, Neuralgia, &c., but to all other diseases where debility, weakness, and fatigue are prominent; and one object of these Lectures is to recapitulate, and—so to say—

* It is strongly insisted upon that our certificate is strictly limited to authorizing the holder to carry out treatment *only* under direction of the ordinary medical attendant of the patient. We absolutely set our face against any Masseur or Masseuse using our certificate as an authority to treat a patient without such medical supervision.

to consolidate the knowledge we have acquired during the past half-year.

Modern Massage.—"Scientific Massage"—the Massage of to-day—may be defined as "The Art and Science *of medical rubbing, combined with various manipulations and exercises by the operator upon the whole or a part of the body of the patient*, added to certain other exercises *executed by the patient:* and to certain associated methods of purely local applications made by the operator."

The above definition is somewhat "misty," but exact definitions are always difficult: and it probably covers the ground fairly well.*

Unscientific Massage was practised long ago. The Chinese used it. The Greek Fathers of Medicine advocated it to restore health to the sick. The Egyptians employed it, not only as a remedy in disease—but to add flesh to those ladies, unduly thin, and to take it away from those too generously gifted.† Next, the Romans adopted it: and after the fall of the Roman Empire, the Arabs, those inheritors of most of the ancient arts, kept it from oblivion, and so it descended to us.

As with all other things nowadays, so with

* Remember, "*Shampooing*" is not "*Massage.*" Shampooing is only part of a system of cleansing. Massage is a scientific mode of curing disease by muscular manipulation.

† And this is sound physiology. Exercise will make the thin grow stouter; the stout grow thinner: and one of the greatest advantages of Massage is that while permitting all benefit from perfect rest it yet gives every good that can result from exercise. *This is the secret of its success in certain "isolation cases."*

Massage. It runs the risk of being smothered in a multitude of words signifying nothing, and out of a simple thing a mystery is made. The principles of Massage may be learnt in an hour. *To acquire its practice takes months.* ALL modern books on Massage are really copies, *with much padding and useless irrelevant matter,* from Mitchell, who may be fairly called the "*Father of Modern Massage.*"

Mitchell defines his method of treatment as follows:—"The patient lying in bed, the manipulator starts at the feet and gently but firmly seizes the skin, rolling it lightly between his fingers and going carefully over the whole foot: then the toes are bent and moved about in every direction, and next with the thumbs and fingers, the little muscles of the foot are kneaded more largely, and the interosseous groups worked at with the finger-tips between the bones. At last the whole tissues of the foot are seized with both hands and somewhat firmly rolled about. Next the ankles are dealt with in like fashion, all the crevices between the articulating bones being sought out and kneaded, while the joint is put in every possible position. The leg is next treated first as to the skin, then by deeper grasping of the areolar tissue, and last by industrious and more profound pinching* of the large

* The word "pinch" is here used for lack of a better. It is, oddly enough, associated in the minds of many persons with the idea of pain, which of course is not borne out by its true meaning. The process here described is such as I have seen used by one of the most skilful of Masseuses.

muscular masses, which for this purpose are put in a position of the utmost relaxation. The grasp of the muscles should be firm, and for the large muscles of the calf and thigh both hands should act together, the masses of muscle being as it were twisted around the bone, while the hands alternately contract on them. In treating the firm muscles in front of the leg, the fingers or the two thumbs are made to roll the muscle under the cushions of the finger-tips. At brief intervals the manipulator seizes the limb in both hands and lightly runs the grasp upwards, and then returns to kneading the muscles.*

"The same process is carried on in every part of the body, and especial care is given to the muscles of the loins and spine, while usually the face is not touched. The abdomen is first treated by pinching the skin, then by deeply grasping and rolling the muscular wall in the hands, and at last the entire belly is kneaded with the heel of the hand in a succession of rapid, deep movements, passing round in the direction of the colon, while somewhat later the whole belly, relaxed by position, may be shaken by a rapid motion of the grasping hands. Pinching or squeezing of the skin is very valuable in certain spinal troubles accompanied with increased sensation, and in some other cases, if the surface and extremities be very cold: but the best Masseuses often omit it, and rely solely upon the deeper grip

* Remember not to Massage with too great rapidity, for it takes time to communicate sensation.

and rolling of the muscles. The process should not be painful, or more at first than merely fatiguing: but after a time the muscles may be handled with a good deal of strength without causing other than agreeable results. Too much care cannot be used to cover with stockings and warm wraps the parts after in turn they have been subjected to Massage. As to time: at first the Massage should last half an hour, but should be increased in a week to a full hour. Sometimes I use it twice a day, but commonly one hour suffices. Women who have a sensitive abdominal surface, have of course to be handled with care, but in a few days a practised rubber will by degrees intrude on the tender regions, and will end by kneading them with all desirable force. The same remarks apply to the spine when it is hurt by a touch: and it is very rare indeed to find persons whose irritable spots cannot at last be rubbed and kneaded to their permanent profit. The daily Massage is kept up through at least six weeks, and then if everything seems to me to be going on well, I direct the rubber or nurse to spend half of the hour in exercising the limbs as a preparation for walking." *So writes Weir Mitchell.* *

The words I have just read to you are indeed Massage *words of wisdom.* They come from the man who thirty years ago *first* advocated and has since continuously practised scientific Massage: and as

* "Fat and Blood." By S. Weir Mitchell, M.D. J. B. Lippincott: Philadelphia. 1885.

they were only *republished a year ago*, they contain the very cream of the whole matter; and remember, before their republication they were *undoubtedly* carefully reconsidered by a man possessing such a reputation as Weir Mitchell, as to whether he should add to them. Need I say that his experience has surpassed that of all his disciples put together—and what do we find? He uses simple language. He describes the treatment he advocates in words "understandable by the multitude." The word "*Mesopotamia*" is not to him, as it was to the poor, old dying body, "a word of comfort," though it would seem to be so to some of his followers! He does not mystify an admirably simple and useful method of treatment by clothing it in a gaudy uniform borrowed from the French. He says nothing about "*Friction*," "*Effleurage*," "*Tapotement*," "*Petrissage*,"—nor does he even in his own language talk about "spanning," "rolling," "sawing," "stroking," "felling," "chopping," and the rest of it. In simple language he describes the treatment: and, above all, he is entirely silent as to that most pernicious suggestion which has been advocated by some writers upon Massage that the mind or will of the Masseuse "*might, or could, or would, or should*" react upon the mind or will of the patient!

For some time past I have been anxious to speak to you very seriously upon this aspect of the question. Although a certain number of the general public may seek your services as Masseuses, *your*

success, and the final, and I hope great success of this School, will depend not only upon your being thoroughly qualified for your work, but also upon whether or not our School secures the thorough confidence and support of the medical profession. That profession looks with wise suspicion upon new things and new undertakings. It holds aloof at first and waits: but if satisfied that the new thing is a good thing—a thing good for their patients—a thing without a taint or even *suspicion* of quackery about it—it sometimes comes to its support with energy and kindness. So will it be with our School if you will do as I want you to do. Take my word for it—if the medical profession suppose for a moment that this School supports any theory of "Moral or Mental Massage," they will stand aloof from us.

On the part of the School I entirely repudiate any such theory.

But you must not misunderstand me. No one can more thoroughly recognize than I do the power of sympathy, the wonderful influence for good upon a patient, if he or she believes that the *first* desire of the doctor and the nurse is to cure their patient. (And patients are very acute in such a matter, and quickly see how the land lies.) What did Sir John Lubbock say at Charing Cross Hospital—and his remarks are, to a large extent, as applicable to nurses as to medical men?

"Physicians, he said, are successful not merely

from their technical skill and knowledge of medicine, but from their knowledge of human nature—*from their tact and kindness.* The best physicians of the day are remarkable, not more for their medical knowledge and skill, than for their charm of manner, their human kindness, their warm sympathy with suffering. One man will do more without a single dose of medicine than another can effect with the whole *Materia Medica* at his disposal. The wise physician is not merely a dispenser and selector of drugs, or a skilful operator. He is the family friend, the trusted adviser, the counsellor and comforter in many a trouble and anxiety."

So say I. That influence, tempered of course by surrounding circumstances, I cordially support, but that influence is *not* the influence against which I have felt it my duty to enter an earnest protest!

All remedies depend for good or evil upon two principles. Firstly, whether in the individual case they should be administered at all; and secondly, it being granted that their administration is called for, the mode in which they should be given, and, above all, the DOSE. If this were not so, anybody could qualify as a physician by reading a book. Take, as an example, a dose of morphia—what shall be its strength? Shall it be administered by swallowing, and so really being digested and absorbed in the stomach, or shall it be injected under the skin of the arm, and so be absorbed at once into the system? Again, take Electricity? What variety

shall be employed—of what strength? How frequently? What shall be the duration of each application? Lastly, take Massage: and the questions I have just submitted to you apply equally to it as to Electricity. With both, the *Dose* depends upon the power of the application and upon its duration. With both, you may either soothe or excite, either stimulate or exhaust: and therefore, as much as in the administration of any drug, you must carefully regulate your *Dose*. With Electricity the doctor can tell you the dose to apply. He can direct you the exact strength and the exact method of application, and the exact duration; but with Massage he cannot do this. He can direct the method and the duration, *but he cannot direct the strength*, and that is all-important, for the Masseuse is not a machine—her "Massage Grip" must depend firstly and chiefly upon whether she possesses sense or no sense; upon her bodily strength; upon her state of health; upon whether she has had large practice, and has been properly taught; and upon whether she possesses a conscience, and will do her work or shirk it; and here comes in the importance of practice. As Demosthenes said about oratory: "Firstly, action; secondly, action; thirdly and always, action;" so say I about Massage—"Practice," "Practice," "Practice!" And I would especially impress upon you the varying susceptibility of different patients to different degrees of Massage strength. With all patients begin with low power.

You can always put more power into your elbow, or rather I would say into your hand and fingers.

I differ altogether from the common belief of medical men that it requires more skill to adequately apply Electricity than it does to apply Massage, and my reasons I have just stated to you. For its adequate application, or for its most perfect application, the qualities possessed by women rather than the qualities possessed by men are required; the *sensitive* rather than the *strong* hand, and patience, kindness, tact, and sympathy.

I hold to the opinion which I read the other day, that when a doctor and a nurse think they are "*managing*" an invalid nervous, suffering woman, you may depend upon it that in nine cases out of ten they are "mismanaging" her.

But to return:—So much for general principles! Weir Mitchell does not in his printed works give complete instruction. Perhaps because he knows that these matters cannot be learnt from books. I quite agree with him. But still, after thorough work in the Hospital wards, the student may be materially assisted by a concise description of the details of manipulation which have previously been practically demonstrated.

I therefore proceed to describe general Massage as used at our School. By "general Massage" I mean Massage of the entire body. When partial Massage is ordered, of course only that prescribed by the medical attendant will be carried out; but the

following general description will include all minor variations of the treatment.

The principal processes of Massage are generally called "*Friction*," or rubbing; "*Effleurage*," or tickling or lightly squeezing. This generally means confining the Massage to the skin. "*Tapotement*," or tapping, and "*Petrissage*," or kneading, with many minor subdivisions of these four, with which I need not trouble you. You must, however, regard them as general terms rather than precise definitions, for no two writers on Massage exactly agree in their explanation of them. These methods have by other writers been called, "*Frictions*," "*Percussions*," and "*Movements*," with similar unnecessary minute subdivisions.

"*Friction*" may be light, moderate, or strong. Light friction has a tranquillizing, soothing effect. It will not unfrequently relieve a nervous headache, or send a restless patient to sleep. Moderate friction is a moderate stimulant. It stimulates the circulation of the blood in the capillaries, and produces a feeling of warmth, and the skin is slightly reddened. Strong friction is a powerful stimulant of the cutaneous nerves, arteries and veins, and if applied too forcibly a discoloration or bruising of the skin may result from the rupture of the capillaries. You must remember that there is a vast difference in the delicacy and sensitiveness of the skin in different patients. Friction causing hardly any sensation with one will give rise to pain with another. Of

course we know the skin of a woman is generally more delicate than a man's, and you may remember Carlyle mentioning that while the tanned skins of the men guillotined during the "*Terror*" in the French Revolution, made leather most useful for covering saddles, the skin of women could only be made into inferior gloves, which the gentler sex of the great unwashed of that day complained were constantly splitting. But still this variation in skin texture is not universal, and some men have skins quite as sensitive as women's. In many cases a flesh-glove or a hat-brush is more useful in friction than the hand.

"*Effleurage*," as I have said, means tickling or lightly squeezing or rolling the superficial layer of muscle, and is of little value except as a relief both to the Masseuse and patient, and a useful variation during a prolonged Massage from the more powerful applications.

"*Tapotement*" or "*Percussion*" means tapping or striking with different degrees of force, and either by the hand or fingers, or by an instrument, upon the surface of the body. Instruments used are a sheep's bladder blown full of air, fastened by a short string to a short stick or handle, and used as a kind of flail; an india-rubber air-ball fixed to the end of a piece of cane—which possesses, as you know, some elasticity; a ball covered with wash-leather, stuffed with wool, and also fixed to a handle of cane; and a bundle of birch branches damped in water; but you

will very seldom need any of these appliances, and it is far better to depend upon your own hands. Slight percussion may be made with the point of one finger or the points of the four and the thumb brought together; stronger by the ulnar side of the hand, holding the fingers apart or together as desired, or by the knuckles, or the palm, or the partially closed hand, or by the clenched fist, which last of course is the most powerful. The percussion should be made quickly and with decision. Generally one hand only is used, but now and again both may be used, or they may be used alternately; percussing first with one hand, and then with the other. With percussion, especially, you should remember to begin with low power, which, if necessary, can be increased.

"*Petrissage*" or "*Kneading*" is far more important than all other processes of muscular Massage put together. *It is by far the most essential part of the treatment.* It cannot be better described than by saying that it consists in the most complete and most thorough kneading, with both hands, of the muscles or other organs operated upon—upon the principle, and very much after the manner, in which the baker kneads dough. No amount of description or demonstration can teach you more. It is by practice only that you can acquire it, and I may add that it is chiefly by superior dexterity in Petrissage that one Masseuse is superior to another.

So much for general details. The methods I describe are applicable, of course, to the surrounding

skin, muscles, and tissues of a joint, but in massaging joints themselves, other exercises are impressed upon them. As I have already told you, the movements executed by joints are flexion, extension, abduction, adduction, rotation, circumduction, pronation, supination, and, to some degree, lateral movements. In general Massage you exercise upon a joint the movements natural to it, and in this there is no difficulty; but the matter is altogether different when the joint is diseased, sprained, or otherwise injured. Although in what are called "joint cases" surgical opinion has greatly changed of late, and the "rest treatment" of an inflamed joint has largely given way to the combination with it of occasional Massage; still, joint affections are so serious, that I can only advise you to never undertake them without explicit directions from the medical attendant as to the exact *direction* and degree of strength with which he desires the joint to be moved. The only other movement in addition to the movements just named is called "*Traction*," which is a movement used on the articulation by pulling one part while supporting the other, or by pulling one part in the opposite direction to the other. Tractions are especially used in sprained joints to facilitate the re-establishment of the soft parts which may have become misplaced.

Although Massage cannot be learnt from pictures, the following figures after Schreiber* will materially

* "A Manual of Treatment by Massage and Methodical Muscle Exercise." By Joseph Schreiber, M.D., Member of K. K. Gesellschaft der Aerzte of Vienna, &c. Edinburgh: Young J. Pentland. 1887.

assist the student in practising in private,* the various manipulations demonstrated to our class, and they will also illustrate and explain the details of the German system of Massage. Schreiber begins by explaining what he terms "*Pressure*," which may be performed in a variety of ways—one, two (Fig. 2), or

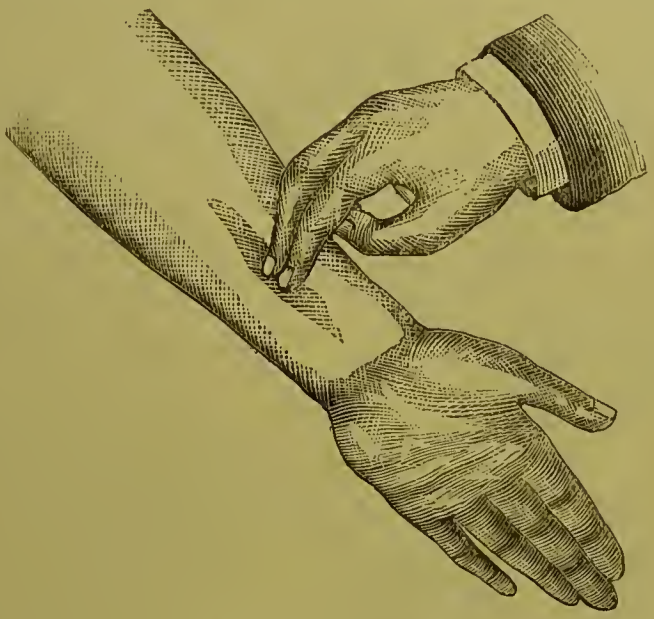


FIG. 2.—"*Pressure.*"

three fingers being used according to the size of the part to be treated, and the force which it is intended to use. The participation of the little finger (Fig. 3)

* It is a rule of our School that no students shall be admitted to examination unless they shall have *repeatedly* practised upon themselves, and upon every part of themselves, the various manipulations of Massage, and every variety of Medical Electricity. It is not sufficient that they should have assisted in carrying out these methods of treatment upon patients, and it is regarded as essential that from *personal experience* they should know the different degrees of sensitiveness of different regions of the body.

is only apparent, for being considerably shorter than the ring finger it cannot touch the part to be manipulated simultaneously with the others: its feebleness, too, would render it at best of little use. Although the index-finger is also shorter than the middle, it is only a little shorter, and it therefore more readily adapts itself to the middle and ring fingers. Of the different fingers, the thumb is of the most use, owing to its shortness and strength, and to its possessing special muscles of its own. If the sensitiveness of the patient or the condition of the parts will not allow the finger-tips to be used, the second joint of the index-finger, or those of the index and middle fingers combined, may be used (Fig. 3), or three or even four fingers may be associated in action, and pressure can be increased by using instead of the second, the combined third joints of the four fingers which form the fist (Fig. 4). Should still greater pressure be desired, instead of



FIG. 3.—"*Pressure.*"

the surfaces of the combined first joints, the knuckles —*i.e.*, the heads of the metacarpal bones—may be used (Fig. 5). Other things being equal, the pressure exerted is less the more joints there are between the shoulder of the operator and the parts of the hand used in pressure, for a large portion of the muscular power brought into play must necessarily be used in the fixation of the joints. The amount of pressure depends a good deal upon the position the operator

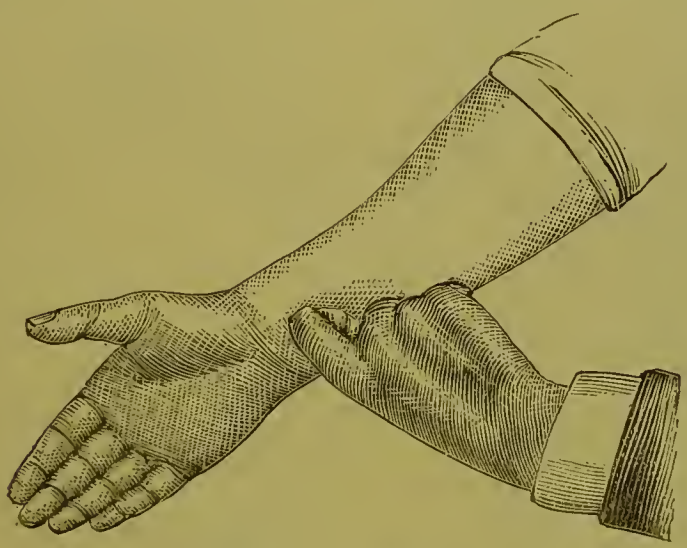


Fig. 4.—"*Pressure.*"

takes towards his patient. In a sitting and standing posture the weight of the trunk can be used to increase pressure, and when the patient lies extended on a couch a maximum pressure can be obtained, for the whole weight of the trunk then helps to augment the muscular force. Each mode of applying pressure enumerated above may be modified in three ways.

First, the fingers or fist used for pressing are

caused to make slight lateral or rotatory movements.

Secondly, they are caused to move continuously from the point of application to some other spot —upwards or downwards—pressure being simply changed to stroking, *the degree of pressure remaining the while unaltered.*

Thirdly, they are caused to make very short

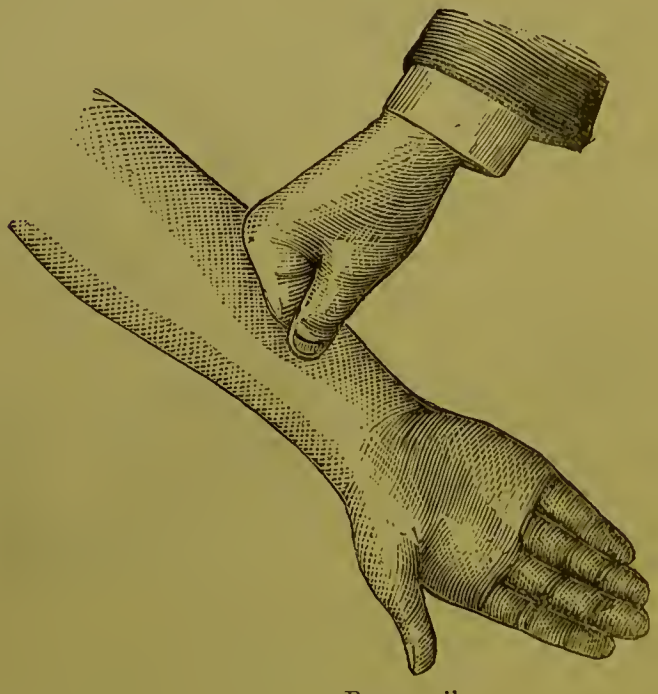


Fig. 5.—"*Pressure.*"

continuous movements, during which pressure is first increased and then diminished. In accomplishing this the hand of the operator leaves each time the point of application to be applied anew; thus the procedure of "Kneading" is evolved from that of pressure.

The operation of tapping ("*Tapotement*") is executed with the tips of the half-bent fingers, the hand being moved at the wrist. It is only capable of producing mild effects, such as are used for neuralgias of the cranium. There is a movement, sometimes called "Thrusting," performed with the finger-tips of the rigidly extended hand (Fig. 7), or with the clenched fist (Fig. 6), the arm being moved partly from the elbow and partly from the shoulder. This manipulation is useful where deeply lying parts between groups of muscles are to be reached, as in rheumatism and neuralgias in the larger muscle groups (as in the buttocks and thighs), and also where marked effects generally are desired. Thrusting and tapping produce a vibration or concussion which (in the nerves) propagates itself from the periphery to the centre.

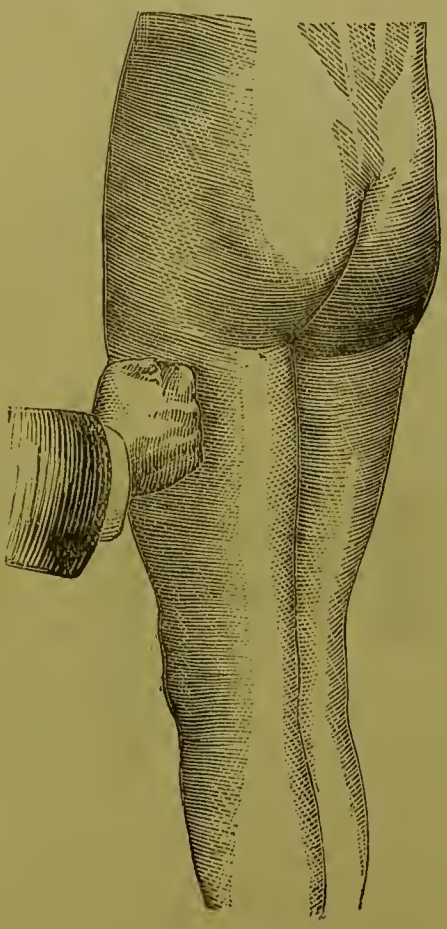


FIG. 6.—"*Thrusting.*"

What is termed "*Hacking*" is performed with the edge of either the extended fingers or hand (Figs. 8,

9, and 10), according as mild and superficial, or powerful and profound effects are desired. In the first case (edge of the extended fingers), the motion originates in the wrist-joint, the fingers being as it were flung against the patient's body; while in the second (edge of the palm) the motion proceeds either from the elbow or from the shoulder-joint. The latter manipulation allows of the employment of the greatest amount of force, and is used on such large muscle groups as those of the thighs, buttocks and neck (Figs. 9 and 10).



Fig. 7.—"*Thrusting.*"

"*Pinching*" has two varieties. In the first of these, the thumb on one side and the four fingers on the other, form, as it were, the jaws of a pair of pliers acting perpendicularly to the part operated on (Fig. 11).

In the second (Fig. 12), the thumb and fingers are not applied with their tips, but with the balls of the last joints; and of all manipulations this one is the most fatiguing to the operator. It requires a powerful thumb, and in performing it

the fingers should be brought close together, for when separated less force can be exerted.

"*Squeezing*" is but a species of pinching, but the fingers remain passive, acting solely for fixation of the part, the thumb alone coming into play (Fig. 13). Squeezing should, at first, be applied perpendicularly to the spot manipulated, and afterwards the thumb may be rubbed backwards and forwards with considerable power.



Fig. 8.—"*Hacking*."

Such is Schreiber's method, and I am very glad to have had an opportunity of demonstrating to you these international variations, for they suffice to show how, with slightly differing details of application, the essential principles of Massage remain the same, whether as performed by the ancient Greeks and Romans, by the present Chinese, by the Germans, or by ourselves.* *But I*

* "And great is the use of rubbing to the dog, and to the horse. One should rub the loins with the right hand, placing the left under the belly in order that the dog may not be hurt from being squeezed from above

would especially ask you again to never forget that, although such plates as I show you may assist you to recollect what you have seen in our Out-Patient Rooms, they are utterly useless to teach you Massage, which can only be acquired by demonstration and daily practice. The methods of applying the hands are pretty much the same in all countries, and with all operators; but the force and power and skill with which they are applied differ largely, and constitute all the difference between a thoroughly accomplished and a thoroughly inexperienced manipulator.

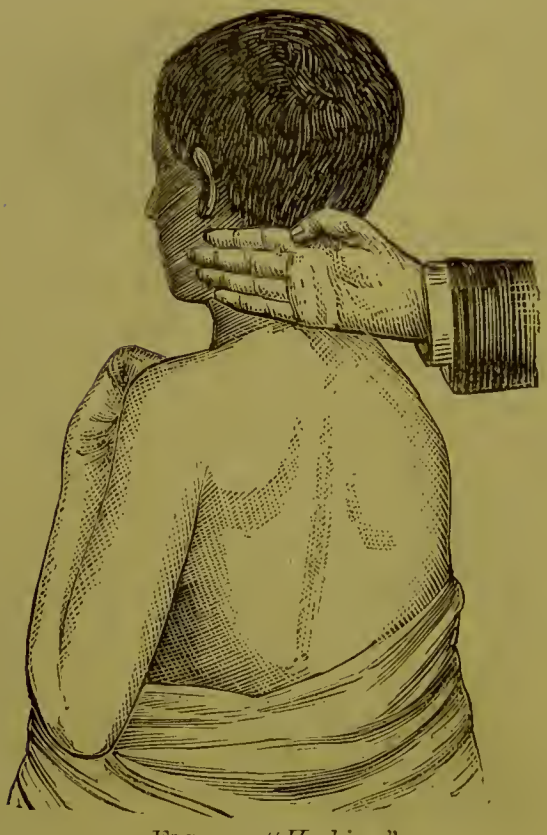


FIG. 9.—"*Hacking.*"

And now I will shortly recapitulate a complete Massage of the body, but I do not advise that you should upon *every* occasion

into a crouching position, and the ribs should be rubbed with both hands, and the thighs and legs, and the extremities of the feet and the shoulder-blades as well. And when he seems to have had enough, lift him up by the tail, and having given him a stretching, let him go. And he will shake himself and show that he likes the treatment" (*Aryan Cyneticus*, A.D. 234). What becomes of the pretensions of modern inventors of Massage after this ? ! ! !—GRAHAM.

employ all the varieties of manipulation I am about to describe; but you *must* know how to use them all if desired.

Continental authorities recommend that you should always begin at the foot and work upwards, because in many cases there will be found some weakness in the circulation, and upward pressure will—it is said—assist the return of the venous blood to the heart. I do not myself attach much importance to this theory, and it matters little where we begin.

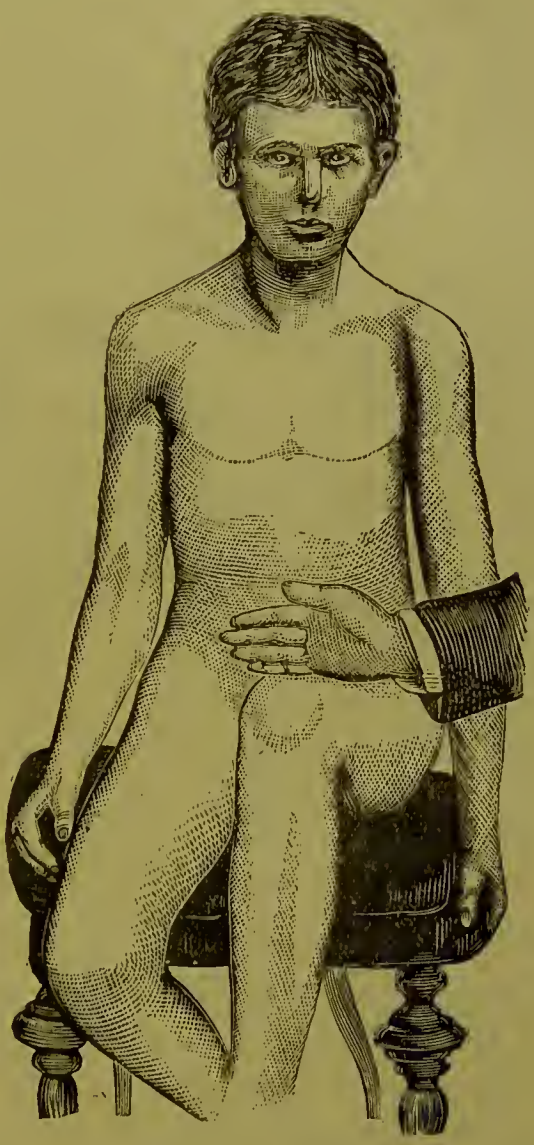


FIG. 10.—"*Hacking.*"

Let us then commence with the right foot.

Apply friction to the toes, arch of the foot, and as far as a little above the ankle-joint. Then, holding the metatarsus with the left hand,

impart every possible movement to the four outer toes together and separately—kneading them thoroughly. Do the same with the great toe. Thoroughly knead the muscles of the foot and continue to lower part of leg. Grip the leg above the ankle, and execute upon the ankle-joint all its movements. Then similarly operate upon the leg to about the lower third of the thigh—so as to influence the muscles

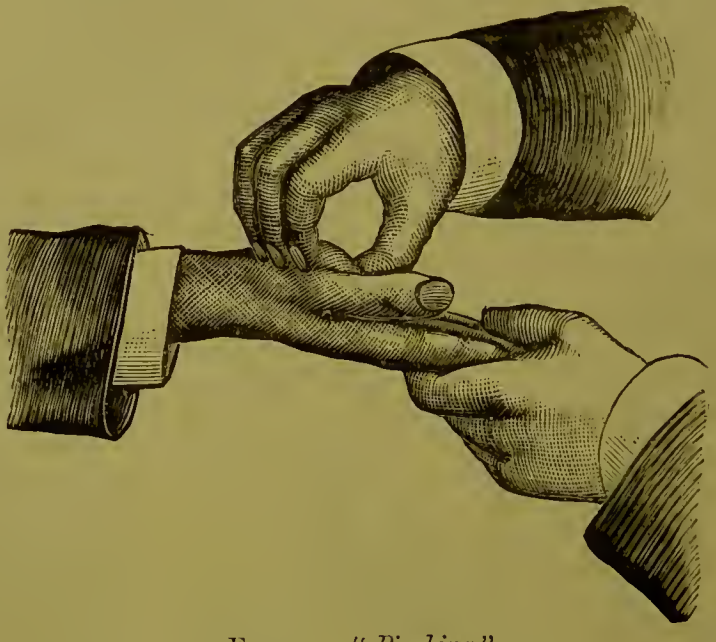


Fig. 11.—"*Pinching.*"

throughout their entire course from their origin to their insertion. You will observe that some muscles have their origin above, and their insertion below, the knee. So on with other joints.

Then treat the calf muscles. Then massage the knee-joint. Hold the leg below the calf with one hand and apply the other to the lower and back part of the thigh. Then apply flexion, and with one

hand raise the thigh moderately, and with the other bring the leg back towards the buttock. Then with one hand hold the lower extremity of the thigh and the knee, while in the palm of the other hand you place the heel, and give a firm resting-place for the bottom of the foot and toes along the forearm. Then press gently on the knee while pulling towards you, and at the same time raising the heel, you draw the leg out to its length. Then massage the muscles of the thigh, following them from their lower insertions either from the shin bone or the knee-pan to their higher insertions into the thigh or the iliac bone. You then massage all muscles from the waist downwards—working upwards as before. Then, one hand holding the seat and supporting the back, the other hand takes hold of the heel and raises the lower part of the thigh while the leg bends on the latter. Flexion obtained, you replace the leg lengthways, and with one hand always supporting the seat, you draw downwards the lower part of the thigh which is held as if for bending. For circumduction



Fig. 12.—"*Pinching*."

movements on the thigh, you place one hand on the seat as before. Tell the patient to half bend the thigh, so that when you place the other hand on the bended knee you execute circumduction, abduction, adduction, &c.

Repeat the massage as just described upon the entire left lower limb.

Then the lower limbs being warmly covered, the patient being placed upon the back in a semi-recumbent position, the knees slightly raised so as to relax the abdominal muscles, you first employ friction, then percussion, and then deep and thorough kneading of the entire abdominal contents, pressing both hands, sometimes open, sometimes partly open, sometimes quite closed, well into the tissues. If you specially wish to massage any one of the contents of the abdominal cavity, you concentrate your manipulations upon the region occupied by the organ upon which you desire to act—*e.g.*, for the large and small intestines you massage the lower part: for the stomach, the upper: if the liver, the upper right hand: if the spleen, the upper left:



FIG. 13.—"*Squeezing.*"

but you cannot concentrate massage upon any one of these organs without influencing the parts adjacent, because of the thick cushion of muscle, &c., interposed between you and the organ you desire to influence.

Then the abdomen and thorax, being warmly covered, commence to massage the fingers of the patient's right hand. Take each finger separately by your thumb and fingers, and treat it as you did the toes. Then grasp the entire four fingers and flex and extend them *en masse*. Then take each finger separately between the thumb and fingers of your left hand, and hold it firmly. With your right hand —between its thumb and finger—take the end of each finger: flex, extend, and slightly rotate it. Deal separately with the thumb in like manner. Then treat the carpus and metacarpus exactly as you did the tarsus and metatarsus in the foot. Treat the wrist-joint as you did the ankle-joint, the forearm as you did the leg, the elbow as the knee, the arm as the thigh, and the shoulder as the hip. That is, you hold the forearm just above the wrist and execute all movements of that joint. Grasp then the arm with your left hand, and with your right hold the forearm a little above the wrist. Flex, extend, pronate, and supinate it. Treat the arm muscles and the muscles in front, the muscles of the shoulder and the corresponding muscles of the upper part of the back in like manner. Then by the left hand take hold of the upper part of the shoulder, and grip the arm with

the right hand a little above the elbow, and make all movements as in other joints.

You repeat all we have done with the right upon the left upper extremity.

The patient then lies partly reclining on his back, and slightly lying on the part not to be first massaged. Treat the neck and muscles upon the side we are massaging just as we have treated other regions. Then treat the other side similarly. Then put the patient semi-reclining upon his stomach and thoroughly massage the muscles of the back of the neck and all down the spine, paying especial attention to the muscles of the lower part of the spine and the loins. In general Massage, massage of the face is seldom required, but if so, you carry out the treatment we have used upon other regions of the body, paying especial attention to gentle friction from the forehead downwards.*

In many cases massage should be carried out upon the clothed body, when probably the best dress is a suit of thin flannel. Linen is not suitable, as the hand slips easily and soon becomes fatigued. For women, the dress should consist of loose trousers coming below the knee and fastening around the calf with an elastic band, and a comfortably fitting jacket buttoning down the front and reaching to the middle of the thighs. For men, trousers and undershirt fitting not too tightly.

* On the hairy scalp a mild form of beating, performed by drumming with the tips of the fingers, is often of use.

The *combinations* of Massage and Electricity (either separately or together), with various baths, are, in certain cases, distinctly advantageous.

At Aix-les-Bains, "*Massage Douche Baths*" have been very popular and successful; and by the courtesy of Dr. Brachet, and my old and valued Colleague here, Dr. Wakefield, Physicians to the Thermal Establishment at Aix, I was shown over them a short time ago. They certainly surpass any other baths upon the Continent in the completeness of their appliances for the treatment of diseases of the nervous system.

Their "*Massage Bath*" is administered under several forms. The patient has sometimes two jets of water playing upon him, and he is, at the same time, massaged by two masseurs. This is a "*Double Massage Bath.* If with one jet only, and one masseur, it is a "*Single Massage Bath.*" Another method is to carry out the different manipulations of massage while the patient is reclining in an ordinary warm bath; a fourth method is to massage the patient with hands thoroughly moistened; and a fifth (originated by myself) is to cause the body to be sponged over with *very* hot water, *before* and *after* massage. The last method must not be confounded with the ordinary processes conducted at Turkish bath establishments.

It is *essential* that the water should be *boiling;* that (as I tell my patients who carry out treatment at home) the "kettle should be boiling on the fire, and the steam issuing from the spout." Then if a sponge

is placed in an empty basin, and if only so much boiling water be poured upon it as will moisten it, it may be taken in the hand of the operator without danger of scalding him or the patient, and the part about to be massaged may be sponged without fear, but *with discretion.* The *essence* of the treatment is the application of very hot water, of water so hot as to distinctly and largely redden the skin, This method was suggested to me some years ago by Sir James Paget, and I have since largely employed it with the best results.

So much for the processes of Massage.* Let us now shortly recapitulate Ling's system, or the Swedish movement cure. Ling died in 1839. He thus describes his system :—"The oneness of the human organism, and the harmony between mind and body and between the various parts of the same body, constitute the great principle of my Gymnastics. Gymnastic movements are movements which differ from movements in general in this—that, though the latter require space and time, they do not require a determinate space and a determinate period of time and degree of force. It is this settled and definite amount of space and time in which the movement is to be done, as well as the determinate degree of force with which it is done, that enables us to influence the body, or a

* Douglas Graham very pertinently asks: "Can one do Massage on oneself?" His reply is: "Not very well, for action and reaction being equal and opposite, it is somewhat like trying to pull oneself over a fence by the straps of one's boots."

single part of it, in the manner necessary for our special purpose. To raise the arms in a loose random way without thinking, and to stretch them in the air, can have little corporeal effect, and certainly no mental one: but to stretch the arms in a manner and direction, and with a velocity and force, all previously determined and exactly prescribed, and then to move their different parts (upper and fore arm, hand and fingers, &c.) precisely as determined and commanded, this is a *Gymnastic Movement.* To make friction along the course of a certain nerve, vessel or muscle, or an entire limb, or any other part of the body, with a gradually increasing or constantly equal pressure, in a slow or quick time, more or less frequently repeated, in shorter or longer intervals, in a determined form, &c., according to a previously prescribed manner, is another instance of a gymnastic movement.

Every gymnastic movement has:—

1. *A commencing position.*
2. *An intermediate position.*
3. *A final position.*

Supposing I stretch my arm out straight from the shoulder, the palm of the hand being upwards. That would be "a commencing position." The forearm bent at a right angle would be "an intermediate position:" the forearm bent to an acute angle, the fingers then touching the shoulder, would be "a final position." The movements just demonstrated constitute "Forearm Flexion." When extension instead

of flexion is required, the process is reversed. The previous *final* position is the *commencing* position—the previous commencing position becomes the final one,



FIG. 13A.

and the intermediate position remains the same in both.

"Active Movements" are those made entirely by the patient.

"Passive Movements" are made entirely by the operator.

"Half-active or Combined Movements" are a combination of active and passive movements. The patient is permitted to originate the movement:



Fig. 14.

or to "give the impulse:" but he is not permitted to determine the direction and time. On the other hand, he may be permitted to resist and to determine the direction and time, while the operator gives the impulse and force.

The names of the principal movements are—"flexion, extension, felling, twisting, turning, pulling, pressure, separation or abduction, bringing together or adduction, guiding, posture, walking, spanning, lifting, overturning, balancing, stroking, sawing, kneading, tapping, chopping, &c."

"Let us suppose a patient to be suffering from weakness of the flexor muscles of the forearm. According to Ling, the flexors must therefore be strengthened by exercise. But exercise of the entire arm is contra-indicated, otherwise the antagonizers of the weakened flexors would be strengthened as well. Ling very correctly observed that in such a case, the healthy muscles being more completely under the influence of the will, would be strengthened proportionately more than the weakened ones. A certain resistance therefore must be opposed to the unconscious contraction of the flexors (Fig. 13A), and this can be effected by substituting the force of the operator for that of the muscles. By this, the latter being put in a condition of complete inactivity, the flexors alone are compelled to work. Isolation of the function of a single muscle group may be accomplished in two ways.

1. The operator opposes his power to that of the contracting muscles, as in Fig. 13A, the limb being extended. Ling calls this the "concentric duplex" movement—"duplex," because two individuals engage in it; "concentric," because the patient's muscles have to overcome a resistance

which prevents flexion—*i.e.*, a movement towards the trunk.

2. The patient semi-flexes his forearm, thus contracting the affected flexors, whilst the operator seeks to extend it forcibly (Fig. 14). Ling called this the "excentric duplex movement," because the force acted in a direction away from the body. Experience alone can teach us to regulate the force necessary to be employed. In the correct estimation of the precise amount required, the superior skill of the operator will be most clearly shown. There should never be anything approaching a struggle between patient and operator.*

As you are aware, we also employ the important and very philosophical method of treatment originated by Dr. Mortimer Granville, to whose kindly courtesy I am indebted for placing at my service the woodcuts illustrating his work.

The principle of "*Nerve Vibration*" (so called by Dr. Granville), is the action upon a *nerve*, by mechanical vibration, or "*tapping*," applied by a special instrument with its accessories, as designed by Dr. Mortimer Granville.†

The benefit derived from such a method of treatment becomes comprehensible to all of us when we recall to mind—as must be so largely in our ex-

* *See* Schreiber, op. cit.

† "Nerve Vibration and Excitation." By J. Mortimer Granville, M.D., &c. J. & A. Churchill, New Burlington Street.

perience—how simple friction of the skin will sometimes soothe very acute pain.

The essential part of the apparatus used is shown in Fig. 15. The "*Percuteur*" is, as you see, held in the hand of the operator, and its vibrations may be brought into action either by the agency of electricity or by clockwork. A is a slide by which the speed and the power of the stroke may be regulated. B is the pointed ivory hammer, or other fitting, by which

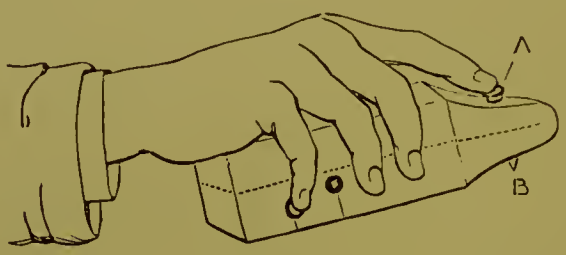


FIG. 15.

the percussion is made. A flat-headed hammer, or a wire brush, may be substituted for the ivory point.

The complete apparatus and accessories are shown in the following figures, and it can be obtained from Messrs. John Weiss & Sons, Surgical Instrument Makers, 287 Oxford Street, London, W.

The *rapidity* with which the "little blows"—if I may so call them—can be administered, may be regulated to a nicety, and Dr. Granville attaches much importance in treatment to this exact regulation of rapidity. He considers that a high number of vibrations is required to relieve a dull, aching, or what may be called a "massive," or "grinding pain,"

while, on the contrary, a "*sharp*" pain is arrested by a slower vibration. As an instance: a medical man complained of severe neuralgic pain, resulting, as he supposed, from a blow by a cricket-ball. The application of the instrument entirely relieved the pain, probably by improving the nutrition; and the net result of the general treatment would seem to be that by it we have a means of eliciting function, and stimulating nutrition, which, *in appropriate cases*, surpasses for directness and rapidity of action any other system or method.

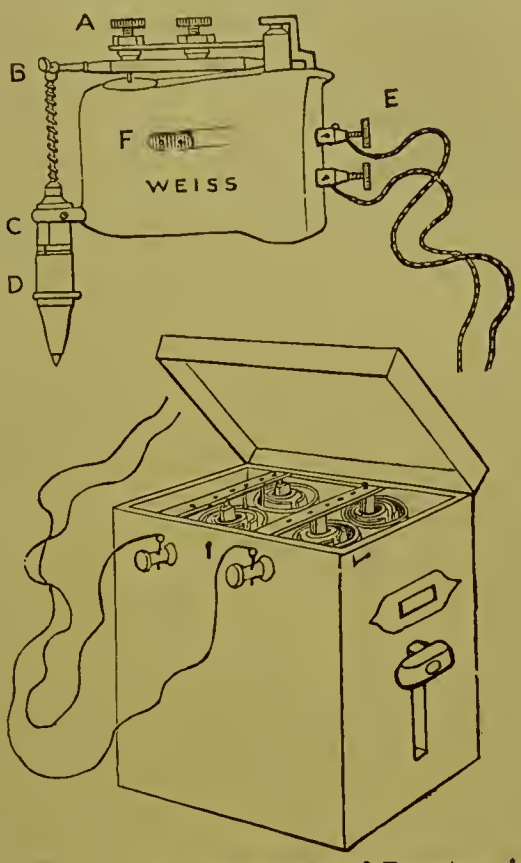


FIG. 16.—The latest form of Percuteur is shown in the upper part of figure: and the second figure shows a Battery of four Bunsen's Cells, with which to place the Percuteur in action.

"Relieving and *curing* pain are two totally different processes, and it is only with the latter that nerve vibration has any concern." *

* Mortimer Granville, op. cit.

Every organ of the body—as, for instance, from the liver to the parotid gland—may be made to perform its proper function by exciting the nerve which supplies it with energy. In this way the liver may be unloaded, and also inveterate torpidity of the intestines. Again, locomotor ataxy has been removed or sensibly ameliorated; and the general im-

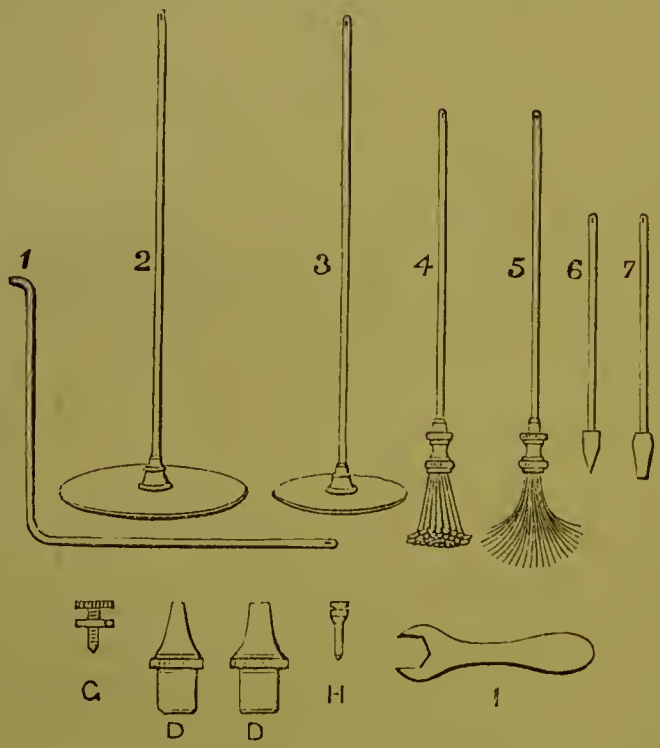


Fig. 17.—The various accessories of the Apparatus.

provement may be fairly described as having been astonishing. But remember, Nerve Vibration is not the rival of Electricity, but it is sometimes a substitute for it; and these agents, as with Massage and Electricity, and the Swedish Movement Cure, may be wisely used in conjunction or alternately. *All* will greatly help to replace the use of drugs!

We must not forget that if we are to attain our object, the number of blows given by the percuteur *must be varied.* As a rule, it is better to attack a large nerve, or a "numbness," with a high rate of vibrations; and a very acute pain, with comparative slow and large vibrations. It is of importance, in the relief of pain, to determine as precisely as possible the *exact point of the pain,* and to act upon that point

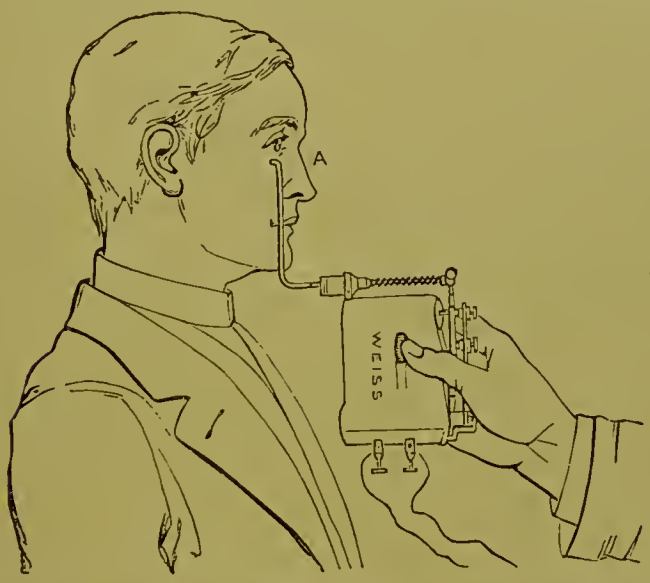


Fig 18.—One method of applying Nerve Vibration for the relief of Facial Neuralgia.

alone. You know how I have, again and again, impressed upon you the importance of this question when we are applying Electricity. The percuteurs have two contact pins, one at the extremity, and the other half-way along the length of the vibrator; and these respectively give different degrees of vibration.

When the pain is relieved, withdraw the percuteur instantly.

The application should be precise and *very light*, and, as I have just said, it should cease the very moment the pain ceases. The aim should always be to gain the desired result with the least force, and with the least duration of percussion; but remember *that by mismanagement failure may be secured and the treatment discredited.*

The relief of pain, though by no means the most important, is undoubtedly one of the most urgent

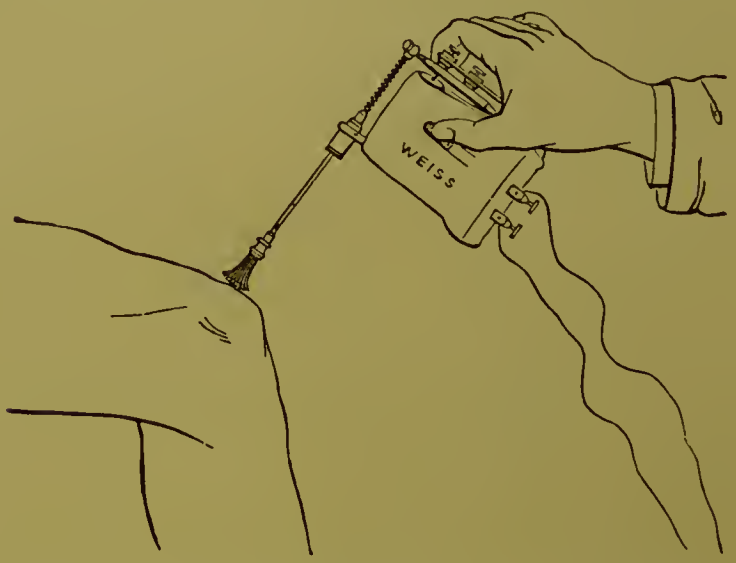


Fig. 19.—Method of application with the "wire brush."

and widely persistent claims which humanity makes on the physician and his art, and anything that will help him must be regarded as a great boon to sufferers.

Nerve Vibration often helps us to control disorderly movements, especially by percussion down the spine, and similarly it has been found most beneficial in certain cases in allaying excitation of the brain.

Again, *by varying the rapidity of the vibrations*, it may act as a stimulant rather than as a calming influence; and in certain cases of impairment of sight, or the impairment of other special senses, it has been found most useful. For example, we know that a sharp blow upon the eyeball will produce a sensation of seeing light; and gentle and daily vibration of the globe of the eye through the closed lid has often been largely beneficial.



Fig. 20.—Method of applying the Percuteur in a Bath.

The great principle of the treatment is this: Mechanical vibrations can be communicated to the nerves; and through the nerves to the nerve centres, to the brain and spinal cord. The point to be remembered is that the influence is twofold—first on the nerve, and then on the central part of the nervous system, which has knowledge of that nerve influence, and which performs the mental part of perception.

Some very remarkable cases have occurred of rapid recovery after confirmed nervous debility, extending over many years. The intense neuralgia which is often found in the spinal region, is often quickly dissipated, and in "*one case Nerve Vibration, administered daily for a fortnight, removed a neuralgia which had involved entire disability for exercise, during several preceding years.*" *

Indigestion and constipation are often relieved, particularly that common form which depends upon

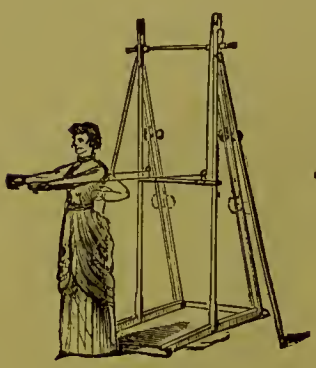


Fig. 21.

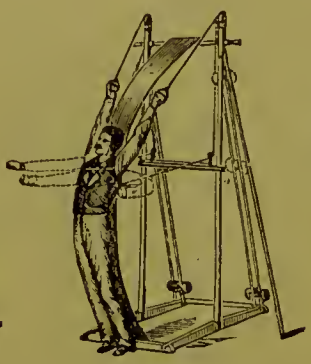


Fig. 22.



Fig. 23.

want of muscular movement in the stomach and intestines.

In various diseases of the nervous system, and especially in paralysis when some degree of strength has been regained, gymnastic apparatus should be called to our aid in addition to the active and passive movements which we have just discussed. The imperative rule is, "*exercise short of fatigue;*" and this is most important, for patients in their

* Mortimer Granville, op. cit.

anxiety to get well are so given to overdoing every treatment left to them.

With regard to gymnastic apparatus, the old system of elastic "extenders," or "bands," should never be used, but a system of graduated weights.

The preceding figures illustrate useful movements.

Fig 21 shows a movement especially applicable to strengthen the arms and chest.

Fig. 22, one for strengthening the muscles of the neck, back, and abdomen.

Fig. 23, a special movement appropriate for curvature of the spine, &c. &c.

Makers of gymnastic apparatus are many, and any one of them will be able to supply the special form desired by the medical attendant. The one that I habitually use is made by the Chadborn & Coldwell Company, 223 Upper Thames Street, E.C., and it admits of more than one hundred combined movements.

"By the use of this apparatus," the *Lancet* writes, "Lateral curvature of the spine should with certainty be prevented, and we know no better means of curing this deformity;"* and equally emphatic testimony to its merits has been borne by other medical journals; while the *Medical Press and Circular* writes that "It creates a fresh interest in the movement cure, and constitutes, we might almost say, the last step possible towards the per-

* *Lancet*, Dec. 27, 1884, p. 1149.

fection of an apparatus which will prove an invaluable adjunct to the Armamentaria of Children's Hospitals, and those *who devote special attention to the treatment of deformities.* There is not an exercise we could suggest that is not here provided for. We have practically tested many of them, and it affords us much pleasure to introduce the apparatus to the notice of the profession and hospital authorities." *

From my own experience of this apparatus during the past four years, I am able to confirm these favourable criticisms, and I would add that every muscle of the body can be exercised *without undue strain*, and that the substitution of *weights which slide with a steady movement* is a great improvement on the old plan of elastic bands, which produced an unequal jerky strain. The curved board (Fig. 22) for strengthening the spinal muscles is an especially marked improvement; and to sum up, the apparatus, *used under medical supervision only*, is calculated to husband strength, and yet bring all the muscles into action; to assist in curing many deformities, and perhaps also certain painful internal diseases.

A *very* important part of Massage treatment is the question of Bathing; and, once for all, I would say that, given an ordinary bath-room *with an adequate hot and cold water supply*, there is *no* medical or electrical bath that, with the assistance, when necessary, of portable apparatus, cannot be as

* *Medical Press and Circular*, Dec. 24, 1884, p. 553.

efficiently administered at home as elsewhere; and, excellent as many bathing establishments are, they necessitate a personal visit of the patient; and we all know how fatiguing this is to invalids; how *difficult* to them; and how often we fail in inducing them, even by the strongest arguments, to avail themselves of these valuable aids to their treatment.

In Massage cases it is nearly always advisable that a sponge bath should be given early every morning. It should be done quickly and carefully. The sponging should be downwards; and the addition of a little eau de Cologne will sometimes make it pleasanter and more desirable where it is intended to get a cooling effect. The sponging should be cold or tepid; usually tepid sponging is to be preferred, particularly in the early period of treatment. It is a well-known rule that baths should not be taken immediately after meals. The sponge bath, however, may be taken after a cup of milk, cocoa, or coffee in the morning, or it may be given, as other baths are administered, between meals, or at bedtime. Even the sponge bath should not be given when the stomach is full of food.

In the treatment of some spinal cases the alternate application of very hot and very cold water is made use of. A sponge is dipped into very hot water, it is squeezed out quickly, and rapidly passed up and down the spinal column; then another sponge is dipped in cold water (to which some ice may have

been added), and the same procedure is used. In this way applications, first of hot water and then of cold, are made, usually from ten to twenty minutes. Care should be taken in these local baths not to have the water dripping or running all over the patient.

A "Hot-air," "Turkish," or "Russian" bath is often beneficial, and there is no difficulty in administering it in the patient's bath-room, or even bedroom. Various forms can be obtained. One of the most convenient is sold by Mr. Hawksley, 357 Oxford Street.

The *complete* apparatus comprises a lamp, boiler, gauze cover and extinguisher, with macintosh cloak lined with flannel.

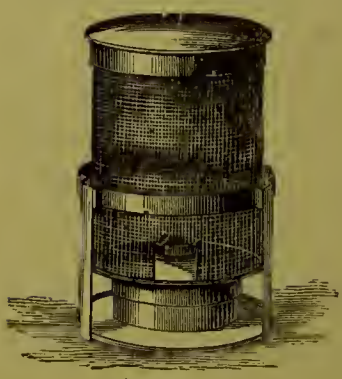


Fig. 24.

The apparatus stands five inches high, and is made of strong tin or copper, riveted and soldered together. It consists of a lamp chamber, having a central tubular wick in communication with the spirit in the chamber. The combustion of the spirit is rendered more perfect by the inner part of the wick being open to the air by means of the holder upon which it is fixed, so that air is supplied to the flame from *within* as well as from *without*, thus producing a larger and more intense flame with less expenditure of spirit than by any other means. The boiler is for water, and rests on the rim or frame of the apparatus

by means of three studs projecting from its sides. These studs, when placed opposite the three supports of the rim, allow the boiler to fit down on to the lamp, thus making it very portable. The steam or vapour issues from three short tubes in the lid of the boiler, and by this means is distributed more equally than if only by one aperture. By the addition of a gauze cover (Fig. 24) and putting aside the boiler it forms an excellent hot-air bath, and with it a waterproof cloak is most efficient, as it most thoroughly prevents the escape of heat; while for vapour, a flannel cloak answers very well. The temperature obtained with the apparatus as a hot-air bath is from 170° to 180° in from ten to fifteen minutes, whilst with vapour the maximum temperature is about 130°. The temperature may be regulated by adjusting the wick higher or lower as the case may require.



FIG. 25.

Fig. 25 shows the apparatus in use. The cloak or mantle for enveloping the patient is made of thick coarse flannel, having a hoop of cane round the shoulders to form a more perfect chamber; an opening at the top admits the head, and is drawn closely round the neck by means of a tape. Any ordinary cane or wooden-bottomed chair will answer to sit upon. The lamp being lighted and placed underneath the chair, the bather is seated, and puts on the flannel cloak, so adjusting it that the

slit from the neck is in front; it can then be buttoned and tied close round the neck, while the hands are inside.

To give a "Vapour Bath," the boiler should be nearly filled with *hot* water. To give a "Hot-air Bath," substitute the gauze cover for the boiler, and take care that it is so placed that the small opening at the side will freely admit the extinguisher.

See that everything is conveniently arranged for use—A table with a tumblerful of cold water, towels, goathair gloves, &c. &c., should be placed within easy reach. If the bath is taken in a bedroom, a sponge or other bath should be at hand for use on emerging from the bath.

Light the lamp and place it *under* or in *front* of the chair; if used *under*, or with a cane-seated chair, *place a towel folded double across it, so that it hangs slightly over the front and sides of the seat.*

It adds much to the comfort of the bather, if a footpan with a little hot water in it, or a foot-stool, be placed on the floor in front of the chair whereon to rest the feet and protect them from the draught.

When quite prepared to take the bath, the bather should be seated and surround himself and the chair with the macintosh cloak, passing his hands through the sleeves the more readily to adjust and tie it round his neck, and having buttoned the slit in front, withdraw his hands within the cloak.

On emerging from the bath, the bather should be

dried and then rubbed from head to foot with a pair of goathair gloves or a coarse towel.

Remember to *extinguish* the light immediately after the bath, and on no account allow the lamp to burn *after* the water has *evaporated* from the boiler, also to *empty* the surplus spirit from the lamp chamber into its can or bottle; this will *avoid waste* from evaporation and any risk if it should get accidentally capsized.

A pocket-handkerchief soaked in cold water should be kept applied to the forehead, and a little cold water should be taken before and during the bath, which should be administered from fifteen to twenty minutes. Should the first bath or two produce any decided oppression or discomfort, discontinue it at once; and at subsequent baths let the patient remain for a few minutes after copious perspiration appears. Afterwards sponge with tepid water, and ventilate the room to remove the heated atmosphere.

To show the importance of maintaining the natural functions of the skin, we may recall to mind that when Leo X. was made Pope, a beautiful child, about three years of age, was gilded all over to enhance the grandeur of the ceremony, by the symbolic representation of the "Golden Age"; but the poor little fellow died in three hours and a half, with all the ordinary symptoms of suffocation.

Thus it is equally true that our health and life depend nearly as much upon the inspiration and

expiration by means of the skin as by the lungs. This wonderful communication existing between the air without and the body within, is carried on by many millions of pores or minute tubes, with which it is everywhere penetrated, which are liable to be affected in a multiplicity of ways. See how destructive to the body is the action of fever while the skin is dry, and what a welcome crisis it is considered when moisture reappears upon the surface. These sweat ducts are the means of communication between the atmosphere and the body. They may be distinctly seen on the surface of the palm of the hand with a magnifying glass, as little depressions along the fine ridges or striæ with which the hand is covered ; and in warm weather, or when the skin is hot and moist, these depressions look like minute specks of moisture. It has been calculated that there are distributed over the surface of the body from seven to eight millions of these fine tubes or pores, the orifices of which can only be seen, and that their united length exceeds twenty-five miles ; at the same time exposing collectively a superficial area of about fifteen square miles. It is this enormous and complicated system of drainage which in disease requires to act with greater freedom, and thus furnish the body with a ready outlet for its impurities.

It is sometimes desirable that the vapour of a "Russian Bath," or the air of a "Hot-air Bath," should be medicated—as, for example, with calomel, sulphur, iodine, &c. ; and hollow tin tops are supplied

with Mr. Hawksley's apparatus for this purpose. I may remark *en passant* that when the skin is softened and its pores opened by the bath, these various medicaments are to a large extent absorbed by the skin. This is a very powerful means of influencing the system, and surely it is in every way (not to mention cleanliness) preferable to the antiquated fashion of "*rubbing*" into the body various medicated ointments; for the *dose* is much more rapidly absorbed (the body being *surrounded* by the medicated vapour) than it can be when disguised in a greasy or other ointment.

Similarly, certain vegetable extracts, such as the alkaloids of opium, may be volatilized during the vapour or air bath, and absorbed by the skin. This method indeed is not only a very efficacious, but a very pleasant and elegant mode of administering remedies, and it is calculated to replace in appropriate cases, particularly when a long course of the same treatment is indicated, the somewhat nauseous process called "drinking physic."

One word as to the *sequelæ* of a bath. The goat-hair gloves are especially suited for a "rapid rub down" after the bath. The patient may then lie down for a time *lightly covered*, and drink a cup of coffee or cocoa, as may be desired or not, and then be dressed, or return to bed. Avoid heaping bed-clothes on a patient *directly after the bath.* A good thick sheet alone is generally sufficient while the patient rests from a quarter to half an hour.

Having now considered external applications, whether by revulsion or absorption by the skin, I propose, for a moment, to consider absorption by the lungs ; absorption by inhalation—the most rapid and *direct* method of absorption, and a method of treatment which is daily becoming more universally used by the medical profession ; and which is a most efficacious and powerful means of administering all remedies that can be volatilized by heat, and there are few, if any, that cannot so be. Probably one of the best " inhalers " is that of Dr. Siegle. " The spray," Dr. Siegle writes, "is produced in the following manner :—When steam is generated and discharged with considerable force through a horizontal tube with which a vertical tube is connected, the vertical tube is exhausted, and if one end of it is immersed in fluid, the fluid rises to fill the vacuum, and reaching the capillary orifice at the top, is caught by the rushing column of steam, and blown into the finest spray ; and it is claimed by the inventor that this spray is finer and more uniform than that produced by any other means, and the instrument when once set in action works by itself, and requires no other attention than the most timid patient can give without trouble ; and the medicated fluid being brought into contact only with glass cannot be decomposed, nor can it cause corrosion of any part of the apparatus, which being so simple in its construction is free from liability to get out of order. To put it in use, fill the boiler with water (hot water

is preferable) and replace the cork stopper firmly. Place the lighted spirit-lamp under the boiler. Fill the glass bottle with the medicine to be inhaled, and return it to the case made for its reception. If the glass tube should get obstructed, or the medicine not rise readily, clear the points by dabbing the orifice with a camel-hair pencil while the steam is passing; but no pin or needle should be used for this purpose,



FIG. 26.—Method of using the Inhalation.

as they invariably destroy the fine points of exit for the spray. A fine bristle may, however, be used, or the points may be dipped in clear water, and suction may be applied to the wider end. At the end of the administration clean the tubes by pulverizing a little clear water, which will secure a good working condition for the next use. The medicated spray

can be inhaled close to the spray tube, or at a more or less distance from it, and if it gives annoyance to the patient by being diffused over the face, a screen should be used, which may be made of glass in the shape of a funnel, and the smaller end held close to the mouth or the nostrils, as the case may be." The method of inhalation is shown in Fig. 26.

As I have repeatedly impressed upon you, the best results are to be obtained *only by combined methods of treatment*—by Massage, by Electricity, and by Medical Gymnastics; and although these Lectures have been devoted especially to Massage, associated methods of treatment have necessarily been referred to. And I would take this opportunity of asking your attention for a moment to what I said to you in my Lectures upon Electricity *—as to electricity in general, and as to an especially novel mode of applying it—viz., *by currents of low power for lengthened periods*—a method originated by myself.

This mode of treatment promises to bring within the range of cure a class of cases of disease, more especially certain forms of nerve prostration and analogous conditions, and some varieties of epilepsy previously little amenable to medicine.

For very many years ingenious forms of so-called "Galvanic Batteries," "Chains," "Bands," &c., have been recommended to be worn upon various

* "Electrical and Anatomical Demonstrations," with 45 illustrations. By Herbert Tibbits, M.D., &c. London: Churchill.

parts of the body; and it has been said that a galvanic current, generated in them, circulates through the body. There is no doubt that electricity is generated, but worn as advocated the current never leaves them; for it always selects the best conductor, and a metal chain is many hundreds of thousands of times a better conductor than the skin. Having worn such appliances a patient may have many scars upon his skin, but these are caused not by electricity, but by the caustic product of the chemical action upon each other of the moistened metallic links of the chain. We all know that blisters, mustard leaves, and similar applications often do much good, and when benefit has resulted from these chains, they have acted in a precisely similar manner; *and in none other*. It is hardly necessary to say that the only way in which the so-called electric, magnetic, and other appliances encased in flannel or cloth can possibly do good, is from the flannel *preserving warmth merely as an article of clothing*. The effect of electricity applied to a patient by the method most commonly adopted—say by two moistened sponges connected through sponge holders and conducting cords with the terminals (*poles*) of the battery depends upon two factors: (1) the power of the current, (2) the duration of the application. A powerful current applied for a short time may sometimes be replaced by a milder one for a longer time; but as a rule this is not so; and the results differ. Of course a powerful

application for a short time differs altogether from the same power applied for a long time; as, for example, stimulation only having been desired, this may have been carried by too prolonged application to the point of exhaustion. Electricity, at once the most powerful and yet the shortest in duration, is found in the flash of lightning which, instantaneous only in duration, may cause as instantaneous death. The duration of an average electrization is from fifteen

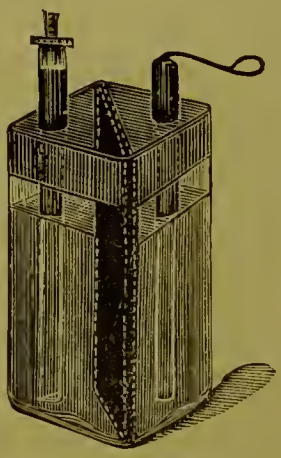


FIG. 27.



FIG. 28.

to thirty minutes, once or twice daily; but for some years I have conducted experiments, both in hospital and private practice, with currents of low tension applied for many hours together, and I am satisfied that such an apparatus is a valuable addition to the medical Armamentarium: for it is simple and inexpensive, *and especially it admits of being kept in perfect working order by the practitioner himself, or under his direction by any intelligent nurse.* It con-

sists of from one to four modified Leclanché cells, measuring 4 inches by 1½ inch (Fig. 27).

A piece of porous felt is fixed, as there shown, diagonally across the cell, dividing it into two parts. The carbon element to which the binding screw is attached is immersed in a mixture of water and crushed carbon and peroxyde of manganese. The zinc element with its wire loop is immersed in

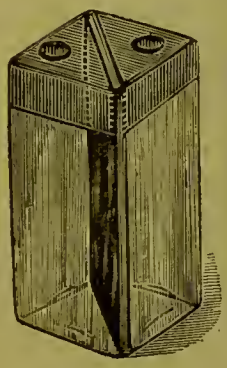


Fig. 29.



Fig. 30.

a solution of sal-ammoniac. In Fig. 27 the elements are shown free from one another, so as to exhibit them clearly, but in practice they are united by the loop from the zinc being screwed to the top of the carbon, as in Fig. 28.

Supposing the cells require recharging, all that is necessary is to unscrew the binding screw of the top of the carbon, release the loop from the zinc, *then*

lift out the cell or cells. A common skewer (seen to the right of Fig. 28) may then be used to separate the remaining contents of the cell if caked together. The cell should then be washed out, and when empty it will appear as seen in Fig. 29. About half fill one division with sal-ammoniac, and the other similarly with a mixture of carbon and manganese. Introduce the zincs and carbons as before, care being

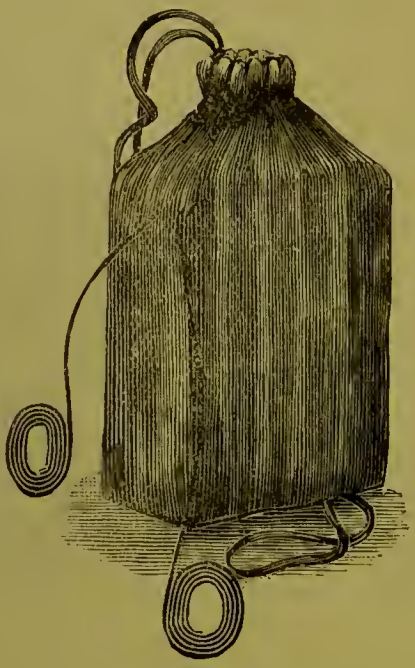


FIG. 31.

taken *not to fracture the carbon, which is brittle;* and to avoid this, the skewer may be used to make a path, as it were, for the carbon. Water should be then poured in till each division of the cell is about three parts full. This is all.

There is now placed at the service of the profession a portable battery, which any intelligent nurse can

always keep in perfect working order without the annoyance, delay, and expense of constantly sending it to its maker.

A baize bag divided into four compartments is convenient for holding the cells, as it will hold either one or four, and can be slung round the neck; carried in the pocket, or, if used at night, placed upon the pillow. Patients are very liable to *drag* upon the conducting cords and so pull out the carbons, as shown in Fig. 30, *and to fracture them upon attempting to replace them.* By running the

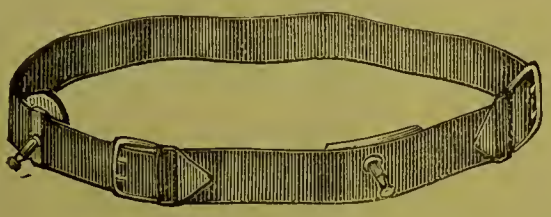


FIG. 32.

cords through the bag, and closing it tightly, as shown in Fig. 31, this is prevented.

Any conductor desired can be screwed to the terminal ends of the conducting cords. The following are useful forms :—

The necklet (Fig. 32) is fitted for application to the throat or cervical spine, or the limbs; or, when lengthened, as a waistband, to the lumbar spine; and when so applied as a waistband, the rectal or perineal conductor (Fig. 33) can be attached to it.

The conductor (Fig. 34) is especially fitted for passing the current through the temples, or from the forehead to the occiput, &c., the conductor being

fixed to a sliding steel spring, which can be retracted or expanded to fit any sized head. All conductors must be well moistened before use with water in which a little salt has been dissolved, and then placed in the position desired, slightly pressing upon the skin; and care must be taken *that they are maintained in position and not allowed to get loose.*

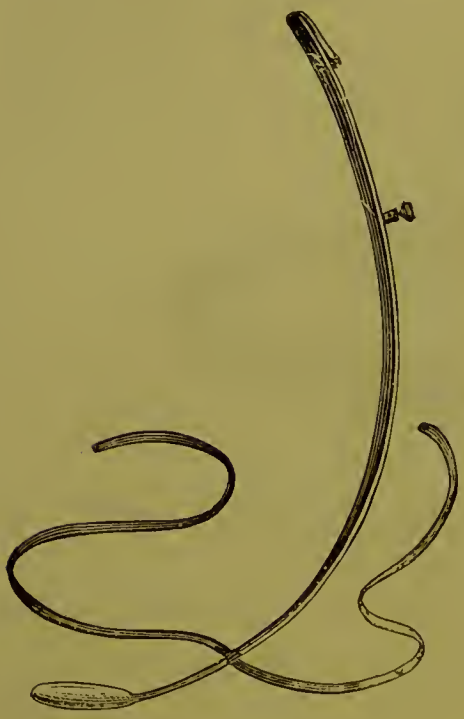


FIG. 33.



FIG. 34.

The continuous and constant voltaic current from one to four cells, according to the susceptibility of the patient, may be applied for from one to six hours per day. Upon many occasions I have found it when thus applied largely beneficial in fatigue diseases; in loss of functional power; in conditions of debility following acute diseases; in cases of general

prostration from overwork or anxiety; in sleeplessness; in asthma; and especially in sciatica and other neuralgic affections; and I am now testing it in a series of cases of locomotor ataxy and epilepsy.

When we know that trees through whose roots a

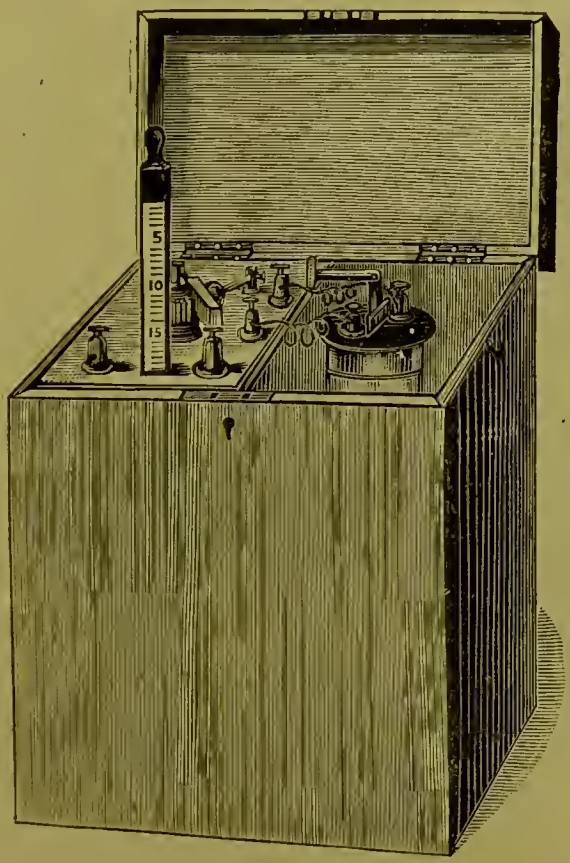


FIG. 35.

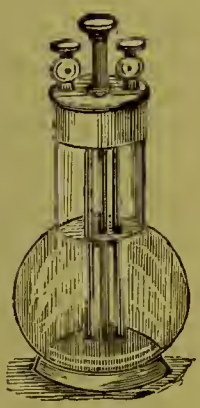


FIG. 36.

voltaic current has been passed for a considerable period *continuously*, have grown much more rapidly than similar trees planted at the same time; and that Legros and Onimus electrized some puppies daily, and at the end of six weeks found that those

which had been electrized weighed more and had grown larger than those of the same litter which had not been electrized, it would seem that the treatment *by prolonged electrization* is full of promise, and that its influence on nutrition should be carefully studied.

As it is important that all electricians and masseuses and masseurs should be able to keep their own batteries in order (and this I need not say is especially important when they may be in residence upon patients at country houses far removed from electrical instrument manufacturers), I append a few notes upon medical electrical apparatus generally.

To keep in order a faradaic, electro-magnetic, or as it is sometimes called an induced current battery, presents little or no difficulty to the trained masseuse and electrician.

One of the most approved forms is shown in Fig. 35. It is worked by a single cell, shown in Fig. 36, when removed from the battery, and *in situ* in Fig. 35.

To place the battery in action, the glass jar (Fig. 36) being about three parts full of the exciting fluid,* the zinc plate is pushed down into the fluid.

* The exciting fluid is prepared as follows:—Dissolve 2½ ounces of bichromate of potash, or chromic acid, in 16 ounces of boiling water. *When cold* add 2½ ounces of the strongest sulphuric acid ("*Acid Sulph. Fort.*"). Pour the mixture, which should be made in a jug, into an ordinary wine bottle, and add water to fill the bottle. This bottle will hold enough fluid to recharge the battery about three times.

This zinc plate is shown, in Fig. 36, to be so immersed: but when not in use it is drawn up, as seen in Fig. 35, *above the surface of the fluid;* and the rod to which it is attached having a hinge joint, as seen in Fig. 35, the bending of that joint retains it in position. When the rod is straightened the zinc can

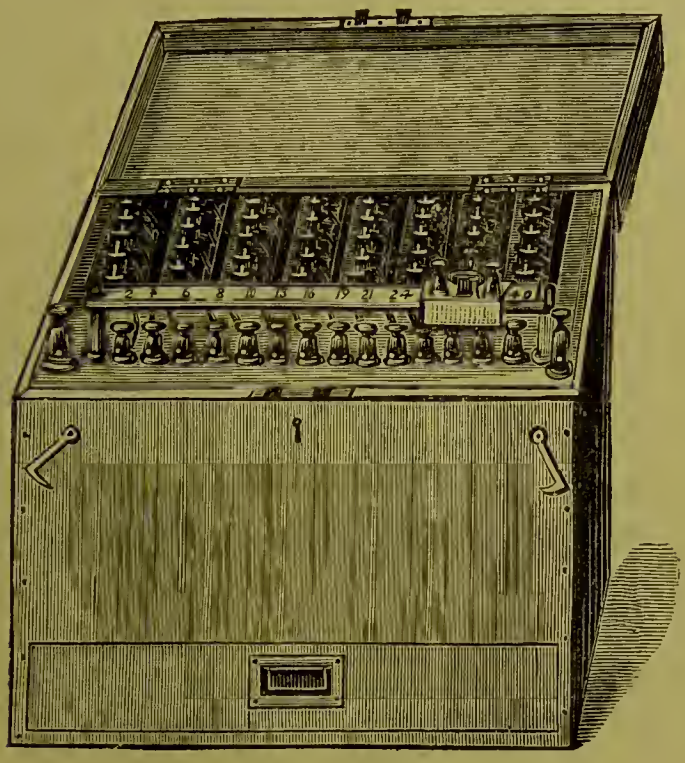


Fig. 37.

be depressed into the fluid. The cell is connected by the two short pieces of telegraph wire with the remaining part of the apparatus: the strength of the current is regulated by the position of the movable stem marked in degrees from 1 to 20 and shown at its highest power in the figure, and the

conducting wires or cords to which are attached the sponges, &c., are fixed to the binding screws seen to the right and left of the graduating stem.

When the power of the battery is exhausted, the glass jar is taken out, its fluid poured away, and the elements dipped for a short time into tepid water to cleanse them from any adhering salts. Fresh fluid is then added and the apparatus again put together.

Of course everything just named is very simple because only one cell is wanted ; but unfortunately, in the far more important applications of the "*Voltaic* or *Galvanic*" current, it is essential that the battery should contain not *one* only, but from 30 to 50 cells, and these cells must also be of sufficiently small size to admit of ready transport of the battery. Without describing the *many* attempts which have been made to supply a battery which, while being sufficiently portable, can be kept in working order by an intelligent nurse, it may suffice to say that the problem has been solved.

The most suitable cells for medical use are the modified Leclanché cells described above.

In the completed battery the cells stand side by side in a mahogany box, as shown in Fig. 37, the zinc of one cell communicating with the carbon of the next. The conducting cords are affixed to a simple and easily adjusted slide, running along a metallic bar and in communication with the elements. *A short wire, as shown in the figure, but shown in greater detail and enlarged in Fig.* 37A, *is brought from the*

second carbon to the stud below the bar marked 2 ; and similarly other wires from the 4th, 6th, 8th, 10th, and 13th carbons, and so on, are brought to the corresponding numbers in rotation marked upon the bar, ending with the last carbon. By the movement of the slide, the current from the number of cells *covered by it* is brought into use : and on its upper surface is an ingeniously devised commutator, by turning which to the right or left the current admits of being reversed without removal of the con-

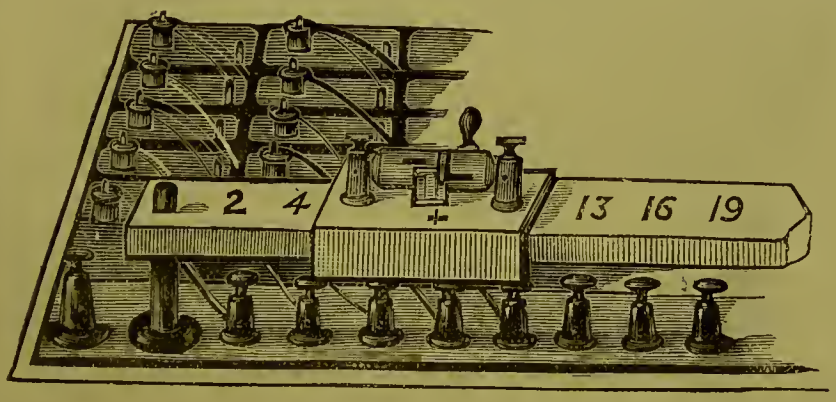


FIG. 37A.

ductors, or of being shut off altogether, in which case the handle would occupy the neutral position, standing vertically, as seen in the figure.

With proper care this battery will remain in order for many months, *but its great and unique advantage* is that, in the event of any one of the cells requiring repair, or when the battery itself requires recharging, all that is necessary is to proceed with all the cells as detailed above in recharging single cells.

Recently a cell, called the "Gassner Cell," has

been patented in Germany. It is a dry cell, and it is claimed for it that it will work without attention until completely exhausted; and that it can then be entirely renovated by passing a current of electricity of sufficient power through it. We are now testing it at the hospital, and it promises to prove a useful adjunct to electrical apparatus.*

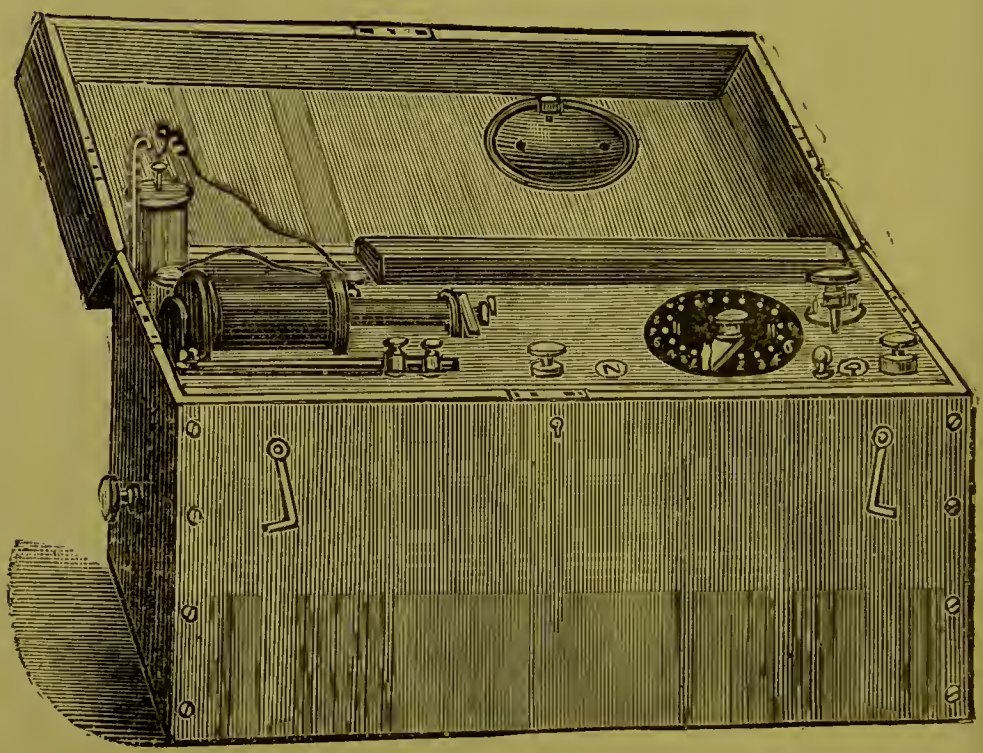


FIG. 38.

Finally, I may say that an apparatus in which both the voltaic and the faradaic currents are *combined* is sometimes convenient. Such an apparatus is shown in Fig. 38, and it admits of the application of

* The batteries and cells described above can be obtained from the Electrician of our School.

the voltaic current alone, or the faradaic current alone, or of the two currents *simultaneously*.

And now, having finished our full consideration of the different ways of applying Massage and allied methods of treatment—having studied the "ART" of Massage, let us look for a moment at its scientific side.

We *know* from our daily experience how greatly our patients improve under it. WHY? And we may well ask this question, for almost every one when suddenly seized with a violent pain involuntarily seizes hold of the painful place, and attempts to relieve it by pressure or rubbing, or both together, and usually with temporary benefit.

If any part of the body be scientifically rubbed and kneaded, not only the greater nerve trunks, but their thousands of infinitely small ramifications, are subject to the influence of direct manipulation, by which nervous energy is largely stimulated and strengthened. Circulation is also increased, the blood and other fluids traversing the vessels containing them with greater rapidity. Hence nutrition is improved by a larger arterial blood supply, while effete and used-up materials are quickly withdrawn by a more rapid venous and lymphatic circulation. An interesting experiment of Mosengeil's, quoted by Schreiber, proves this.* At 9 o'clock A.M., Mosengeil injected a hypodermic syringeful of Indian-ink into both knee-joints

* Von Mosengeil: "Langenbeck's Archiv für Klinische Chirurgie," 1876, 9 Band, 3 and 4 Hefte.

of a rabbit. At 9.30 the right knee was massaged, the rabbit seeming unaffected by the operation, being quite lively and running about. At 9.45 both knee-joints were again injected, and the right knee again massaged. The process was repeated at 3 P.M., and the right knee manipulated as before. In two minutes the swelling of the right knee had disappeared, while that of the left remained permanent; and when the animal was shortly afterwards killed and examined, the left knee was swollen and saturated with the ink while the right was entirely free, *but the lymphatics leading to it were intensely black.* We thus see that it is possible within the space of a few minutes to remove by massage fluid from a knee-joint; and as in such a case pain is caused by the pressure of the fluid upon the sensory nerves, relief from this pain will follow in proportion to the removal of the pressure. Massage then stimulates absorption and relieves pain; and by the quickened circulation of the arterial blood which it causes it also largely increases the temperature, thus being of the greatest comfort to weak and anæmic patients who suffer so much from cold hands and feet.

It is well said by Graham that a study of the natural functions in health might teach us the wisdom of using massage when they are weakened. When muscles contract and relax, they massage each other. The ascent and descent of the diaphragm in respiration continually massages the organs above and below it, especially the abdominal and pelvic

organs; and when its movements are limited from want of exercise or restrained by tight-lacing, it is only too familiar how feeble become appetite and digestion, and how constipated the bowels. Each time a muscle contracts the blood is driven out of it, and as it relaxes blood enters again and its nutrition is maintained, while if it remains inactive it soon suffers in size and strength. But the effects of exercise and massage are not alike in all respects, for voluntary exercise means exercise of the nervous system quite as much as of the muscular, and *sometimes* more; besides, the cases that are often much benefited by massage are those of overtaxed brain and used-up nervous system, to which exercise in the ordinary sense would only increase the exhaustion, and which yet require a mechanical stimulus of their nutritive functions. Fatigue is an indication that waste is greater than repair, and muscular fatigue from over-exertion, or want of exercise, is relieved by massage, which promotes a more rapid absorption of waste products, and stimulates the peripheral circulation. Fatigue from mental strain is relieved by the same means which increases the amount of the circulation in the external tissues of the body, and thus depletes the overfilled vessels of the brain; for the contracting hands of the manipulator are as it were two more propelling hearts at the peripheral ends of the circulation, co-operating with the one at the centre; and the analogy will not suffer if we bear in mind that the size of one's heart

is about as large as the shut hand, and the number of intermittent squeezes of massage that act most favourably on vessels, muscles, and nerves are about seventy-two per minute, which is about the ordinary pulse rate. If this is not an art which does mend Nature, what is ?*

Du Bois-Reymond considered that all muscular exercises are really not so much exercises of the muscular as they are of the central nervous system, especially of the brain and cord, for the muscle promptly obeys the nerve; but the nerve is simply an organ for the conduction of a motor impulse from the brain, and massage is a "schooling or drilling" of the central nervous system, not a simple muscular massage, but really a brain and nerve massage also. A post-mortem by Reymond lent strong support to his opinion. In 1870 a patient had his left arm amputated at the shoulder, and he died fifteen years afterwards. The part of the brain which sends motor impulses to the left arm was found flattened and wasted from disuse, its volume being four-fifths smaller than the corresponding parts of the other hemisphere. All other parts of the brain were onrmal.†

We will now consider in somewhat fuller detail certain diseased conditions, with their requisite treatment.

Massage and electro-massage are of great benefit

* "A Practical Treatise on Massage." By Douglas Graham, M.D. New York: William Wood & Co. 1884.

† *Progrès Medical*, 1882, No. 24.

in functional uterine irregularities. In a case within my knowledge, after seven days' massage of the limbs, back and abdomen, with electro-massage to the feet, legs and thighs, the menstrual flow appeared after having been absent for nearly three years.

I may mention the signally beneficial results of massage in certain uterine misplacements.

As you are aware, the uterus is an organ freely movable, and therefore, under certain circumstances, apt to get misplaced, with much discomfort and suffering to the patient. When such a condition exists (and of course this must be determined by a medical man), massage is often of the very greatest use, and, *not seldom, will put matters right without any other treatment being required.* Seventy-two cases have been reported; of these thirty-five were cases of chronic inflammation, of which fifteen recovered; thirteen were much improved, and seven remained as before treatment. The rest were cases of enlargement or malposition, and all of them were benefited. The abdominal walls are first massaged gently and superficially to begin with, and then more deeply and vigorously, until sensitiveness lessens sufficiently to allow of very deep kneading.

In addition to misplacements, the uterus is unfortunately given to having tumours in connection with it, and these tumours render the case a much more anxious one to the physician than any mere displacement of that organ could do. In such circumstances we should call electricity to our aid.

Ten years ago or more I wrote as follows :—"The removal and dispersion of tumours by the chemical action of electricity is making daily progress; and it will probably, before long, become a recognized part of *ordinary* treatment. Absorption will, by its use, be usually stimulated at once, and often the tumour will be greatly reduced in from one to three or four months."* I also advocated it in cancers, and I quoted several cases of success from its employment, both in cancers and in tumours.

I was premature in predicting its rapid success. That success has waited for ten years, but it is *now* assured.

The recent publications by Dr. Apostoli, of Paris, of the results of his employment of electricity in the treatment of fibroid tumours, have created a great sensation throughout the medical profession; and I was consulted recently by a lady, who from being a bedridden and hopeless sufferer, has, in twelve months (under Dr. Apostoli's care), absolutely and thoroughly regained her health. By a most ingenious method of electrization, Dr. Apostoli has been enabled to employ, without pain to the patient, much more powerful applications of electricity than were possible before he originated his improved method; and although he did not sow the seed, yet it must be said of him, as was said of St. Paul, that "although Paul planted, Apollos watered," and to

* Tibbits: "How to Use a Galvanic Battery." London: Churchill. 1876.

Dr. Apostoli must be attributed the successful and practical realization of the hopes of many physicians, who before him had earnestly and with much toil endeavoured in vain to give that answer, which he has himself so successfully given, to the all-important question of the best means of relieving multitudes of suffering women! When we see a woman who, in months or years of suffering, has passed through the stages of depression, debility and exhaustion, till at last she lies down in bed, helpless and in despair, rise up after a few applications, with her pains soothed, her bleeding stayed, her countenance brightened, her appetite returning, and the dawn of a new life opening upon her, one is apt to think that medical science has justified itself.

So I say, and I am certain you will agree with me, though I may venture to feel that sense of disappointment always felt by those not first in the race.

Winiwater reports the case of a woman, seventy-nine years of age, suffering from a multilocular ovarian cyst with considerable œdema of the lower half of the body. After repeated aspirations of the cyst the fluid always accumulated in greater quantity than before. The patient declined an operation for its removal. Winiwater concluded to try massage upon the legs, and this soon removed the swelling, relieved the pain, and increased the urine. Later he extended the massage upon the abdomen and over the ovarian cyst, and this decreased in size and remained smaller. Œdema did not return, and

the condition of the patient was improved. It is noticeable that when Winiwater was at one time hindered from repeating the massage for awhile, the former condition of the patient returned. The difficulty, however, soon disappeared, the swelling becoming smaller when Winiwater resumed the massage himself. He emphatically guards himself against being open to the accusation of believing massage to be able to take the place of ovariotomy or aspiration (as, however, it seems to have done in this case), but in cases where ovariotomy or aspiration is impracticable or refused, massage may be of use.*

Massage has been found efficacious in removing the after-effects of inflammation of the womb, in the dispersion of morbid products, in the loosening of adhesions, in correcting local disturbance dependent upon these, and in restoring contractility and tonicity to organs surrounded by involuntary muscular fibres, such as the uterus, the bladder and the intestines, and thus enabling them to resume their normal functions.

Continuing a consideration of the effects of massage upon internal organs, we can easily see that the ascent and descent of the diaphragm in respiration, and the influence of exercise in general, keep up a sort of perpetual massage of the liver which materially aids its functions and preserves the equilibrium of its circulation. Loosely suspended be-

* Graham, op. cit., p 119.

neath the diaphragm by folds of the peritoneum, the situation and attachments of the liver are peculiarly favourable to allow it to gravitate in any direction, to be pushed upwards by full intestines, or downwards by dilated lungs, to be drawn upwards by the arched diaphragm of phthisis, or to gravitate downwards when the intestines are empty. While in health natural movements and ordinary exercises suffice to keep the liver in good condition, yet when this organ becomes hyperæmic, these are of necessity often lessened and insufficient. At every meal there is an increased flow of blood to the liver, and there may be too great a determination of blood to this organ from overfeeding, the portal vein itself being too much filled, and all the digestive organs overtaxed, to overcome which the kings of the Sandwich Islands have themselves "*lomi-lomied*" (a system of massage) after every meal. When this state of affairs has been continued too long without anything to counteract it, there may result hepatic engorgement, the treatment of which by massage has been most successfully carried out. Simple hepatic engorgement or chronic hyperæmia of the liver is indicated by general or partial enlargement of the organ, usually of the left lobe. The abdomen should first be kneaded together, after which the hand is gently passed over the hepatic region, the skin of which is at first squeezed, and afterwards the deeper parts are worked; and this is alternated by tapping with the palmar surface of the fingers, and finally the liver itself is kneaded,

its lower edges being raised and seized by the hand. These manipulations are done with great gentleness, and gradually accomplished. Buoyant feelings result, and the massage is agreeable while being done. By massage the liver is emptied of its fluids as water is squeezed out of a sponge, and the circulation is favourably acted upon and absorption hastened. In most cases the treatment is satisfactory, the general condition of the patient improves, and the dyspeptic symptoms disappear. The time should be long after a meal, when the stomach and bowels are comparatively empty; and the patient should be sitting, with the body inclined forwards, resting upon the elbows, so as to relax the abdominal walls and allow the liver to gravitate downwards and forwards, and this will be greatly aided by the patient making gentle deep and prolonged inspirations. In poorly nourished people who gain flesh under massage and feeding, no small part of their improvement may be often due to the effect of massage over the region of the liver, by which its functions are stimulated, for the bile aids the pancreatic juice in emulsionizing fats, and preparing them for digestion; besides its presence in the intestines excites their peristaltic action, as does the immediate mechanical effect of massage itself. Many no doubt have heard of the invalid lady who was suffering from constipation, and as a result of this indigestion. Her doctor inquired, "Do you ever knead your bowels?" The invalid meekly replied, "Indeed, doctor, I cannot very well do without

them." The resulting burst of laughter shook up the abdominal viscera to such an extent that the constipation was relieved, the indigestion was cured, and the patient got well. *

Obstructions of the excretory gall ducts from swelling or collection of mucus, may sometimes be relieved by massage squeezing out the contents of a distended gall-bladder, and thus pushing the obstruction before it.

In the disappearance of jaundice, and the sudden improvement which occasionally follows examinations of the liver, this is probably what has occurred.

Weakness of the muscular coat of the stomach or intestines with deficient peristaltic action, and consequent disturbance of digestion, accompanied by distension from flatulence or solid contents, is usually benefited to a marked degree by appropriate Massage, which improves the circulation, and pushes along the contents of accessible portions of the stomach and intestines at the same time, besides directly stimulating the muscular fibres to contraction, and reacting on the nerve centres, thus improving function and organization in various ways.

In a case of intussusception (previously referred to by myself) the late Dr. Fagge remarked, "It can hardly be doubted that the life of the patient was saved by kneading of the belly."

* Douglas Graham, op. cit.

In these cases, *Massage* must be prescribed by medical men, because in certain cases acute inflammation (Enteritis) may exist; but when the condition is one of obstruction alone, what mechanical agency can be more likely to disperse a mass of fæces, and push it through a constricted opening, or pull out a portion of involved intestine, than Massage suitably applied?

Several successful cases have been reported.

In one of my cases in consultation with Dr. Greenhalgh, a patient, a lady, had not had an evacuation of the bowels for fifteen days, and she vomited everything she took. The walls of the abdomen in this case being thin, upon careful examination a movable elongated tumour was felt commencing at the right inguinal region and extending to the left. It seemed probable that this was the inferior part of the small intestine, and that there existed a constriction at the ileo-cæcal valve. This mass was carefully *masséed* from above downwards—pushed, in fact, along the intestine—until no more of it could be felt. A purgative was then administered, the bowels were relieved, and recovery followed.

Professor Lobel, of Berlin, has reported the following case:—"The patient was a vigorous, corpulent man, fifty-eight years of age; he had suffered from violent neuralgic pain in the left leg for five years, and this had resisted all sorts of treatment, and for the last two years his life had been passed

between his bed and table; and he was obliged to keep absolutely quiet as much as possible, for he could only repose lying upon his back. Sitting, standing, or walking precipitated paroxysms of pain, which even occurred without change of position, to the number of sixty a day. The pain radiated over the external surface of the left thigh to the knee, and it was also felt in the toes. Except wasting of the muscles of the hip, nothing was observable, and pressure upon the sciatic nerve at its exit did not excite pain. Over the region of the left kidney there was found a flat uneven swelling, but difficult to investigate on account of its deep situation: it was firm and elastic. Five years before the patient had suffered from fever, with violent pains in the renal region. He recovered from the fever, but the pains persisted and assumed a neuralgic character. It was considered that there had been inflammatory exudation, and that the pains were due to a compression of the lumbar plexus by this exudation, and that they were radiated from the lumbar to the sacral plexus. The treatment was daily massage of the limb, hip, and lumbar regions. At first this was painful, but in fourteen days the painful places had disappeared, and the patient began to take a few steps without support, and the paroxysms of severe pain occurred only once or twice during the day. After sixty-four days treatment was discontinued. The tumour had then become very small, neuralgia had disappeared;

he took a walk of three hours every morning, and could get in and out of a carriage with ease."

I propose now, and very shortly, to ask your attention to those classes of disease, which although not the *monopoly* of women, count them among their largest number of victims. Organic diseases of the nervous system are common to both sexes alike, but functional diseases of that system always have been, *now are*, and always will be, the special scourge of women. The greater delicacy of their organization: that intimate relation and sympathy between their nervous system and their sexual functions, whether the latter may be in activity or abeyance; if in activity, the occasional *want* of nerve power; if in abeyance, the occasional *superfluity* of that same power, alike conduce to a disturbance of that perfect equilibrium which is essential to a quiet, not to say a vegetative life, and to that blissful ignorance, possessed, alas! by so few of us, that we possess nerves and a nervous system.

I would desire to point out to you the too little recognized importance *of immediate and adequate treatment* in those less serious cases, which although not involving immediate danger to life, yet involve much misery to the unhappy sufferer, and *immense* misery (hardly to be adequately expressed in words) to all her surrounding relatives and friends. And in this connection I would ask you to allow me to enter my protest against that refuge for destitute physicians and surgeons—the word "HYSTERIA!" *What*

does it mean? What do you understand by it? I have looked up many definitions of it from all writers of repute, and I will not give you any one of them. *The thing is non-existent.* The word is, as I have said, a refuge for destitute medical practitioners, who having to do with dreadfully harassing cases of functional nervous disorder, take "*Hysteria*" as their motto and as their shield, and retire—or do not retire—from the case under its shelter.

Before proceeding I must again ask your attention to the nervous system. That the brain is the organ of the mind cannot be doubted, for the mental faculties depend upon its healthy condition. When it is removed, an animal exhibits neither memory nor will. If it is compressed, or seriously injured, mental power is destroyed. If congested by too much blood, or impoverished by receiving too little, the mind wanders, and the intellect is lost.

What is the agent by which the will, holding its habitation in the brain, transmits its various messages along the nerves? No one can say; and therefore we have fallen back on a *name:* the *Vital Principle.* But what *is* that "*Vital Principle?*" Whatever it is, when it is diminished in quantity or power, *fatigue is induced,* sleep follows, and during sleep this principle is re-developed in the brain, and we awake refreshed; that is, supplied with a new store of vital principle.

I believe this Vital Principle to be a condition of animal electricity, yet to be discovered and demon-

strated, and that it will more nearly resemble the charge of Static Electricity ("Franklinism") than any other variety of electricity.

We know that currents of electricity (generated perhaps by the friction of the stream of blood against the coats of the arteries) are always present in the body. When we are awake, when we are undergoing the wear and tear of our daily life, that supply of vital energy, that supply of electricity stored up and accumulated during sleep, is used up—is exhausted. We sleep again; and during that sleep, by a merciful dispensation of Providence, our "*Fund of Vital Energy*," or vital electricity (*call it what you will*) is re-established, and we are again enabled to bear the heat and burden of the day. The condition described as "Neurasthenia" is, in reality, a disease of the nervous system; and it has been stated that one half of all women suffer from it, but that is an absurd statement. It is really a condition of nerve weakness and nerve irritability, modified in women generally, but not always, by an additional emotional element. It is not confined to any one class in society, and is as common in Whitechapel as in Grosvenor Square.

All uterine derangements are apt to be accompanied by it; and the symptoms are liable to be aggravated during the menstrual period; and you must remember that it may also be acquired by those predisposed to it from imitation of others. It is common for every faculty to become exalted; hearing,

smell, taste, touch, and sight sometimes become preternaturally acute, and sensations, which to those in health are indifferent or pleasant, produce in the neurasthenic the highest degree of discomfort; and, conversely, sensations disagreeable to others may be enjoyed by them. Neurasthenic patients often complain urgently of neuralgic pains in various parts of the body and without any recognizable cause. Neuralgia of the mammary gland is sometimes complained of, while a fixed and severe pain in the left breast is a constant symptom. The skin may become so sensitive that the slightest touch, or the contact of the dress, may be unbearable. Severe pain diffused over the surface of the abdomen is a very common symptom. More or less painful affections of the back, especially tenderness of the spine, are frequently present, and also pains in and about joints, which are not unfrequently taken for gout or rheumatism. Sir Benjamin Brodie, who was the first to direct attention to the frequency of these affections, asserted that four-fifths, at least, of the joint diseases met with in women are purely neurasthenic. The hip and knee joints are most frequently affected, but the ankles, wrists, and even finger-joints may be attacked. The senses of smell and taste are frequently increased in acuteness, while at other times there is a perversion of these senses. The sense of hearing is sometimes extremely acute, while at other times there may be deafness. So with the sense of sight, increased acuteness, or absolute

though temporary blindness. Anæsthesia, or a diminution, or even complete loss of sensibility is common; and, not only so, the senses of taste or smell may be lost, and spasms may occur in every muscle or group of muscles in the head, trunk, or extremities. Spasmodic closure of the glottis may produce alarming difficulty of breathing, and so may spasm of the muscles of the throat make swallowing difficult, or even impossible; and so with the tongue, articulation may be impaired. The stomach also may undergo spasmodic contractions, giving rise to persistent and distressing vomiting, and there may be present also spasm and rolling of the intestines, and spasmodic retention of urine, and there may be partial or incomplete loss of muscular power in any part of the body. Loss of voice from paralysis of the vocal cords is a very common symptom. Neurasthenic patients are also very liable to suffer from paroxysms of palpitation; and they complain also of rushing of blood to the head. There are also disorders of the circulation. You know that the arteries have elastic muscular coats; and it would seem that in some cases their contraction is so great as almost to stop the flow of blood. Dr. Charcot, the great nerve doctor of Paris, believes that this may furnish an explanation of certain reputed miraculous occurrences, as, for instance, the statement made on good authority that in the epidemic of *Saint Medoit*, the sword blows which were given to the "*convul-*

sionaires" did not cause bleeding. Not less remarkable are certain neurasthenic hæmorrhages.

The usual monthly flow ceases: but the patient may bleed (*healthily* bleed) from the throat or lungs; or even "*sweat blood from the skin.*" Bleeding has been observed even from the nipple, as well as from every other part of the body.

Neurasthenic patients suffer from various disorders of secretion and excretion. There may be an increased flow of saliva, or an abnormal dryness of the mouth; and the secretion of urine may undergo frequent alteration. Its large increase is common; but sometimes there may be absolute decrease.

Let us finally look for a moment at the mental, emotional, or whatever you like to call it, aspect of the matter.

There is generally excessive emotional excitability, unchecked by voluntary efforts; and in addition to this, there is a *craving for sympathy:* but mark the distinction between the invalids I now speak of, and those of us who, being fairly healthy, yet crave that sympathy without which life would be desolate. *The Neurasthenic crave sympathy, but refuse it to others!* and it is this *morbid* craving for sympathy which prompts them either to exaggerate a real ailment, or to feign illness when they are free from it—even to inflict bodily injury on themselves for the purpose of arousing compassion and attention.

So much for a general sketch of the "*Neurasthenic,*"

whether man or woman. And the greater part of what I have said as descriptive of the varying symptoms of the disease we are now considering is taken from the great work of Dr. James Ross, of Manchester, who has, without doubt, written *by far* the best treatise upon "Diseases of the Nervous System" that has ever appeared in the English language.*

And now, having, as I think we may say, fairly considered the more customary symptoms of what you call "*Hysteria*," but what I call "*Neurasthenia*," let us devote our attention to a far more important aspect of the question:

ITS TREATMENT!

And let us bear thoroughly in mind that "*Neurasthenia*" is not an imaginary disease. Its symptoms are not "*simulated*" by the patient! It is a *real* disease, depending upon a perversion of function or nutrition, or both.

As regards treatment: a proper amount of sleep is most essential.

It is a well-known fact that the regular alternation of day and night coincides with the nervous sensibilities of all animals endowed with a highly organized nervous system, for the almost universal habit of animals falling asleep as soon as darkness comes on, and awaking with the return of day, is a dispensation of "kind Nature," and if we endeavour to alter that

* "A Treatise on the Diseases of the Nervous System." By Jame Ross, M.D., F.R.C.P., Physician to the Manchester Royal Infirmary. Two vols. crown 8vo. London: J. & A. Churchill, New Burlington Street.

dispensation, we make a grievous mistake. It may be said in general terms, that bodily strength is greatest in the morning and sensibility least, and *vice versâ* in the latter part of the twenty-four hours. In the evening the power of moving and of muscular effort is *least*, but the *acuteness of feeling is more intense*. Associated with this feeling is necessarily an increase of nervous excitability; for impressions appreciated more keenly by the senses, more readily awaken emotions, and you see that the nervous system becomes more sensitive, more highly strung, more ready for the "*Harp of Life*," about which Lord Tennyson so eloquently writes; and this heightened sympathy is more often a source of pleasure than of pain.

Social intercourse, and the usual pleasures of social life, are more highly enjoyed.

The first cause of "*Neurasthenia*" is a condition which often causes great sleeplessness *at hours when sleep is the only normal condition.*

Wakefulness, beyond the accustomed hour for going to bed, indicates an irritable condition of the brain, and *where there is irritability there is always weakness and not strength!*

Prescribe, firstly, exercise in the open air, *pushed to the point of inducing a slight feeling of being tired*, but *exercise short of anything like exhausting fatigue.* This will be a powerful means of securing sleep.

A prolonged warm bath at night, especially when its sedative influence is followed by the tonic of a

cold bath in the morning, is also most advisable. The extreme instability of the nervous system will sometimes bring on "*night-walking*" or "*somnambulism.*" This consists in the ability to perform complicated actions that are related to the circumstances of a dream, and in no relation to the real surroundings of the body of the sleeper; and the mind would seem to be held in a sort of rigid attitude, for the somnambulist will take long walks, perform difficult feats of climbing, attempt to kill persons by whom he imagines himself injured, and even attempt to commit suicide.

Never awaken a somnambulist. Lead him back gently and quietly to bed.

One of the worst cases of epilepsy I have had under my care, was the case of a girl of nineteen, who was a somnambulist. Her relations (I cannot call them her "friends") threw a bucket of water over her. She had some thirty epileptic fits during the next day, and she is now in a lunatic asylum.

In aggravated cases of Neurasthenia, the patient (man or woman) should be removed from home and the presence of relations, and placed, for a period of several weeks, under the care of complete strangers.

In such cases the *principle* is to secure the advantages of absolute rest, as by the patient lying in bed, *combined with the advantage of exercise.* The patient cannot both lie in bed and walk about at the same time; but by this method, while getting the advantage of rest, the advantage of exercise is (if I may

so say) artificially imported by the Masseuse or Masseur.

Also proper food is given, and a proper amount also.

You must remember that the patient has generally taken insufficient food; and, as Weir Mitchell says: "I am daily amazed to see how kindly nervous women take to this absolute rest, and how little they complain of its monotony. In fact, the use of Massage and the battery, with the frequent comings of the nurse with food, and the doctor's visits, seem so to fill up the day as to make the treatment less tiresome than might be supposed: and besides, the sense of comfort apt to come in about a week—the feeling of ease and the ready capacity to digest food—the growing hope of final cure, fed as it is by present relief, conspire to make most patients contented and tractable. *The intelligent and watchful physician must, of course, know how far to enforce and when to relax these rules.* Above all, let him be careful that the Masseuse and the nurse do not talk of the patient's ills. Let the patient only speak of them to himself or herself. *This mode of treatment is valueless without the cordial and submissive assistance of the patient.*

The diet scale of these patients usually commences by large doses of milk, about every two hours—for from four to six days—then raw meat soup for a week or more; then, in addition, a full dinner, ending by coffee; also a chop for breakfast, soup at eleven

o'clock; and, if dinner is at one, then soup again at four, and bread and butter and fruit at seven, and soup again at nine. This is the copy of a typical diet scale of a case of *extreme* nervous exhaustion. The patient would be also galvanized once, and massaged once or twice daily as prescribed by the physician.

And now, quoting from Mitchell, and Playfair, who has done so much to introduce Mitchell's treatment, I will give you instances of what this treatment has done.

A lady was so exhausted that she could not walk across the room. She had come from one of the Colonies, and had been carried on to the steamer and off it in a litter. Her state of health as described had existed for three years, and was getting worse. In two months she was a strong, healthy woman, up to any exertion, and she returned home well, and still continues well.

A young lady of seventeen broke down from overwork at school. There then came complete loss of appetite, failing sight, excessive emaciation and inability to take any active part in the work of life. She rapidly recovered, and is now as well as any girl of her age need be.

A lady, fifty-two years of age, had been confined to her bed for fifteen years. After six weeks' treatment she was completely cured, and went home quite well.

A lady had been in bed for three years. She was

brought up from the country on a couch strung from the roof of a saloon railway carriage, so as to avoid jolt or jar. In six weeks she was well.

Another lady, who for twenty years had spent her life in bed or on the sofa, and who was unable to stand, was well in eight weeks.

Another similar case, confined to bed for sixteen years, was also cured in eight weeks. But probably the most remarkable instance of successful treatment was that of a gentleman, whose case (by the courtesy of Dr. Playfair) I append in somewhat fuller detail:*—

The patient's illness had commenced five or six years previously, when much exposed ranching in America. He was now thirty-three years of age, a very tall man, and once very strong and muscular. This is his own account of his illness, written in September 1883. "About five or six years ago, I began to suffer greatly from indigestion, which reduced my strength very much, and brought on a very severe pain in the right side of the stomach from back to front, which all the doctors seem to agree to be neuralgia. I have the pain daily, almost hourly, and at times it amounts to intolerable agony. I suddenly collapsed about a year ago, and was in bed most of last year. I have now got into a regular weak state; get very bad nights' rest; can take next to no food, and very often bring up what I take. I am simply

* See *British Medical Journal*, November 6, 1886, p. 855.

devoid of muscle, and am nothing but skin and bone. I weighed, the other day, 8 stone 5 lbs. (he was considerably over six feet in height) : I consider my proper weight to be 12 stone 10 lbs."



Fig. 39.—Patient at commencement of treatment.



Fig. 40.—Patient after six weeks' treatment.

It will suffice to say that after a fortnight's treatment, this patient was eating an amount of food that was astounding, and ere long he sailed for a sea voyage, with his proper weight regained. On

December 13, 1885, he wrote: "Since my return, I have been in perfect health, which continues up to the present date. In fact, I believe I am in better health than I have ever been in my life." The appended woodcuts will illustrate the nature of the case, and the results of systematic treatment, better than any amount of verbal description. They are taken from photographs supplied by the patient.

Dr. Playfair has very wisely said: "The condition of many of these patients has been cultivated and fostered by injudicious medication, as surely *as mushrooms are forced in a hotbed.* Such a patient is not a person with a nervous system prone to break down, but one whose nervous system, from some cause or other—shock, overwork, mental strain, and so on—actually *has* broken down, and who has thus become a complete invalid, and incapable of fulfilling the ordinary duties of life. These cases are quite capable of cure in certain ways, which are certainly not those generally adopted. They are not sufficiently recognized, for if so, how does it happen that almost every one of them are able to point to a whole array of doctors under whose care they have been without any material benefit?—the cases recovering, and since remaining in perfect health, as soon as the true condition of matters was fully recognized and acted upon. The truth is, that it is only recently that these cases are being estimated at their proper value, and it is only now beginning to be understood that they need not be given up in despair, and consigned

to lifelong illness, *for there is no class of disease more certainly amenable to proper systematic efforts at cure.*"

Since the first delivery of these Lectures, additional instances of the successful results of the treatment advocated have occurred.

As illustrations I select three cases, and append woodcuts copied from photographs taken at the commencement and termination of the treatment. The patients were not any of them cases of rapid

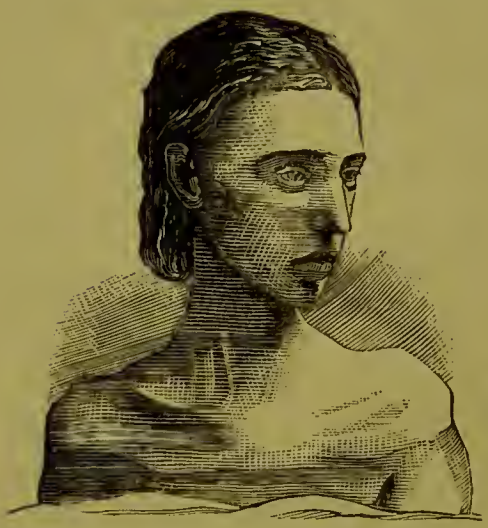


FIG. 41.—A patient, 20 years old.



FIG. 42.—The result of four months' treatment.

recovery after acute illnesses—such as fevers; and in all, the illness had existed for a lengthened period—in none for less than a full year.

The treatment followed was the combination of massage, rest, electricity, suitable diet, and medical gymnastics; and the time in the shortest case was six weeks, in the longest four months.

The following is a typical diet scale from the

second to the third week, which was carefully kept by one of our Masseuses :—

Diet Scale.

September 2nd.

3. 0 A.M.	Glass of prepared milk and a biscuit.
6.30 „	Tea and bread and butter.
8. 0 „	Cocoa, bacon, egg, bread and butter.
10. 0 „	Glass of prepared milk.
11. 0 „	Beef-tea and toast.
12.15 P.M.	Glass of prepared milk.
1.30 „	Minced lamb, toast and sago pudding.
3. 0 „	Glass of prepared milk.
4.30 „	Cocoa, bread and butter.
6. 0 „	Glass of prepared milk.
7.15 „	Six oysters, grouse, macaroni pudding.
10. 0 „	Beef-tea and toast.
12.30 A.M.	Macaroni, biscuit, glass of prepared milk.

September 3rd.

4. 0 A.M.	Biscuit and glass of prepared milk.
6.30 „	Tea and bread and butter.
8. 0 „	Cocoa, bacon, egg, bread and butter.
10. 0 „	Glass of prepared milk.
11. 0 „	Beef-tea and toast.
12. 0 „	Glass of prepared milk and two biscuits.
1.30 P.M.	Ten oysters, stewed plums, macaroni.
3. 0 „	Jelly, glass of prepared milk.
5. 0 „	Cocoa, bread and butter.
6. 0 „	Glass of prepared milk and a biscuit.
7.15 „	Roast mutton, sago pudding, grapes and biscuits.
10. 0 „	Beef-tea and toast.

September 4th.

1. 0 A.M.	Sago, biscuit and a glass of prepared milk.
5. 0 „	Glass of prepared milk and a biscuit.
6.30 „	Tea and bread and butter.
8. 0 „	Cocoa, bacon, bread and butter.
3. 0 „	Beef-tea and toast.
10.30 „	Glass of prepared milk and a biscuit.
1. 0 P.M.	Scolloped oysters, boiled chicken, and sago pudding.

3. 0	P.M.	Beef-tea and toast.
4. 0	,,	Jelly and glass of prepared milk.
5. 0	,,	Cocoa and bread and butter.
6. 0	,,	Glass of prepared milk and a biscuit.
7.15	,,	Partridge, sago pudding, stewed pears, half glass of milk.
9.45	,,	Beef-tea and toast.
12.25	A.M.	Sago, glass of prepared milk and a biscuit.



FIG. 43.—A patient, 17 years old.



FIG. 44.—The same patient after nine weeks' treatment.

September 5th.

5.30	A.M.	Glass of prepared milk and a biscuit.
6.30	,,	Tea and bread and butter.
8. 0	,,	Cocoa, bacon, egg, and bread and butter.
10. 0	,,	Glass of prepared milk.
11. 0	,,	Beef-tea and toast.
12. 0	,,	Glass of prepared milk and a biscuit.
1.30	P.M.	Chicken, boiled potatoes and sago pudding.
3. 0	,,	Jelly.
4. 0	,,	Glass of prepared milk, a peach and a biscuit.
5. 0	,,	Cocoa and bread and butter.
7.15	,,	Cod fish, partridge, sago pudding and grapes.
10. 0	,,	Beef-tea and toast.

September 6th.

1.15	A.M.	Sago, glass of prepared milk and a biscuit.
5.40	,,	Glass of prepared milk and a biscuit.
6.30	,,	Tea and bread and butter.
8. 0	,,	Cocoa, egg, bacon and bread and butter.

10. 0	A.M.	Glass of prepared milk.
11. 0	„	Beef-tea and toast.
12.10	P.M.	Glass of prepared milk and one and a half biscuits.
1.30	„	Chop, sago pudding, grapes and milk.
3. 0	„	Jelly and a biscuit.
4. 0	„	Glass of prepared milk and a biscuit.
5. 0	„	Cocoa and bread and butter.
6. 0	„	Glass of prepared milk.
7.15	„	Turbot, snipe, sago pudding and grapes.
9. 0	„	A glass of prepared milk.
10.15	„	Porridge with fresh milk.

September 7th.

1. 0	A.M.	Sago, glass of prepared milk and a biscuit.
5. 0	„	Glass of prepared milk and a biscuit.
6.30	„	Tea and bread and butter.
8. 0	„	Cocoa, bacon, egg, and bread and butter.
9. 0	„	Valentine's meat essence.
10. 0	„	Glass of prepared milk.
11. 0	„	Beef-tea and toast.
12.15	P.M.	Glass of prepared milk.
1.15	„	Partridge, sago pudding and grapes.
3.30	„	Jelly, glass of prepared milk and a biscuit.
4.30	„	Cocoa and bread and butter.
5.45	„	Glass of prepared milk and a biscuit.
7. 0	„	Sole, chicken, sago and grapes.
10. 0	„	Beef-tea and toast.

September 8th.

2. 0	A.M.	Sago, glass of prepared milk and a biscuit.
4.10	„	Glass of prepared milk and a biscuit.
6.30	„	Tea and bread and butter.
8. 0	„	Cocoa, bacon, egg and bread and butter.
9. 0	„	Valentine's meat essence.
10. 0	„	Glass of prepared milk.
11. 0	„	Beef-tea and toast.
12.15	P.M.	Glass of prepared milk and a biscuit.
1.15	„	Whiting, sago pudding and Valentine's meat juice.
3. 0	„	Jelly, glass of prepared milk and a biscuit.
4.30	„	Cocoa and bread and butter.
5.45	„	Glass of prepared milk and a biscuit.
7. 0	„	Pigeon, macaroni and grapes.
10. 0	„	Beef-tea and toast.
12.45	A.M.	Macaroni, glass of prepared milk and a biscuit.

The patient was a medical man, who had been under the care of eminent physicians for nearly two years. He was unable to retain food, was greatly emaciated, and in a most despondent condition. After four weeks' treatment he had gained a stone in weight, and had resumed the active practice of his profession. To our Lady Superintendent he writes as follows:—"Will you allow me to say how much I valued Mrs. ——'s great kindness. She has done me the utmost good. From being a most wretched miserable dyspeptic, she has converted me into a healthy vigorous man again. No words of mine can in any way be too flattering to bear testimony to her skill as a Masseuse, and her knowledge of dietary in conjunction therewith."

I may add that an important part of the treatment of this case consisted in the combination of Electricity with Massage, by the current being passed through the body of the operator—the "Electro-Massage" of to-day, or the "Electric Hand" advocated by Duchenne (the "Father of Electro-Therapeutics"), upwards of thirty years ago.*

* During the printing of these Lectures two cases have been published in the *Lancet*, the second of which shows that Massage is capable of reducing as well as of increasing weight. It will be observed that the patient lost 2st. 3lbs.

"CASE I.—Mrs. A——, aged thirty-seven, with a decided neurotic history, for the past twelve months had been gradually losing weight and strength, and when first seen presented an emaciated and very anæmic appearance. She complained of weariness along the spine, which was worse in the morning and evening, but did not at any time amount to actual pain. Pressure on the tips of the vertebræ caused no discomfort, except at one well-defined spot in the lower part of the cervical region. Here deep

And now, having given you instances of the good results of our treatment, when suitably carried out and in suitable cases, I would earnestly impress upon you how important it is that patients selected (necessitating, as that selection does, their removal

pressure caused slight pain. The patient also complained of a feeling of numbness and burning in the right hand and forearm, which was much paler in colour than the left. These feelings commenced in the fingers, and gradually extended upwards until the forearm became involved, and after this no further progress was made, and the disease remained quiescent for a time, when the same sensations showed themselves in the left hand, but never amounted to very much. Both hands retained their normal power, and no alteration was noticeable beyond the paleness of the right arm already alluded to, and which no amount of friction could alter. This lady enjoyed very good health until about twelve months ago, and attributes her present ill health to domestic troubles. When first seen she was listless and depressed, and presented a very anæmic and careworn appearance. There was no hereditary history, nor was there any history of constitutional disease. She had been taking medicines for a long time, but without any apparent benefit. These were now dispensed with altogether, and the patient was placed under the massage treatment, under which she rapidly got well; indeed an improvement was experienced from the first week. Special attention was directed to the spine. She is now quite strong, and feels perfectly well in every way.

"CASE II.—Mrs. B——, aged thirty-five, for the past few years had been rapidly gaining in weight, and when first seen weighed 14st. 4lbs. During this time her health had become very much deteriorated, and the slightest exertion, even walking along a perfectly level ground, was only accomplished with difficulty. The muscles were weak and flabby; the heart sounds were weak and the pulse almost imperceptible. She was often seized with faintness, and these attacks were usually preceded by intense pain in the region of the heart, which was relieved by deep pressure. Thirst was a prominent symptom, and it was always worse at night-time. Urine normal, except that it occasionally contained a trace of sugar. There was every indication of the nervous system being at fault, and the patient was told by a well-known London physician that she was in a most impoverished state, and recommended that she should go abroad for two years. 'All kinds of medicines' had been tried without benefit, and lately she had on her own recommendation taken large quantities of some patent drug reputed to diminish corpulency. It had the desired effect, but on its cessation the weight of course increased again. An interesting point in connection with this case is the fact that under the influence of

to London, with much inconvenience and considerable expense), *should be selected with extreme care*, otherwise we get, not credit, but discredit. For, as always happens with a widely used remedy, unsuitable cases are now and again sent to town, with disappointing results; for in massage, as in other things, there are prevalent fallacies as to invariable results; as to the cases most likely to derive benefit, and as to the length to which each *séance* should extend. Some writers advocate an application so long even as two hours, twice or three times a day. Others say from four to ten minutes, three or four times a day, is all that is required. Probably the medium time between these extremes will be the

mental anxiety and worry the weight rapidly increased; indeed, on a few occasions I have known her to gain as much as a pound and a half daily when the mental strain was very great. On the other hand, prolonged rest had the effect of diminishing the weight, whilst even very moderate exercise had an opposite effect. These facts fully demonstrate the neurotic nature of the case, and have an interesting bearing on some points recently brought forward concerning the management of neurasthenic subjects. Massage was employed three times a week, each sitting at first lasting half an hour. After a few weeks it was used daily. The patient's condition commenced to improve after the first fortnight. It ought to be mentioned that at the commencement of the treatment the patient had very little faith in 'the rubbing,' having already tried it in London and Brighton, but it effected nothing beyond a few intractable bruises. The method employed was exactly the same as practised by Weir Mitchell at Philadelphia. Besides the massage, the patient was allowed a Russian bath occasionally. In suitable cases they are very useful adjuncts. After a little more than four months the patient lost 2st. 3lbs. and gained wonderfully in strength. The heart sounds are strong, and pain has long since disappeared. She is now capable of walking many miles without feeling exhausted; and, although the massage has been discontinued for a considerable time, there has been no increase in the weight, but, on the contrary, a slight diminution."—See "Massage as a Curative Agent," by T. G. Garry, M.D., &c., *Lancet*, May 12, 1888, p. 921.

best—half to three-quarters of an hour once or twice daily; but each case must be carefully considered and treated according to the individual requirements of the patient. No one in his senses would prescribe the same method and duration of massage to

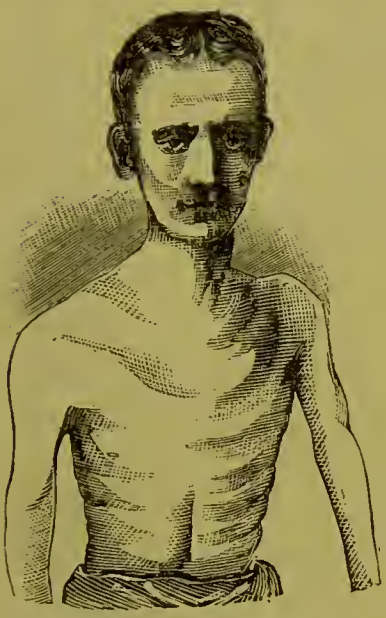


FIG. 45.—A gentleman, 36 years old.

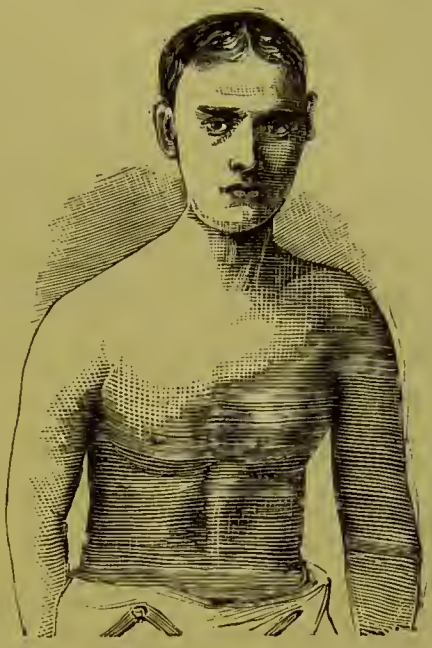


FIG. 46.—The result of six weeks' treatment.

a very stout old lady of seventy, as he would to a nervous, thin girl of seventeen.

Massage is of great benefit in all cases of exhaustion. Fatigue resulting from active work by a healthy man or woman passes away after food and rest; but there is the fatigue of overwork, whether of body or of mind—the fatigue which is persistent, which sleep does not remove, and which is to the sufferer sometimes more unbearable than actual

pain. It is this condition which massage so largely benefits, and its application should invariably be had recourse to. Mosengeil exhausted the muscles of uninjured frogs by a series of contractions caused by faradization. Under massage they soon regained their lost vigour, while a rest for the same period without massage had no effect. A person lifted a weight of two pounds 840 times, at intervals of a second, and could do no more. When the arm had been *masséed* for five minutes he lifted the weight more than 1100 times without fatigue. In addition to this refreshing effect upon muscle, massage exerts upon the nervous system a remarkably delightful and tonic effect; and during its application patients often experience a peculiar calm restful feeling; and paralysed muscles not seldom have their nutrition greatly improved, with sometimes complete restoration of power; *while in all troubles resulting from spinal curvature, when combined with medical gymnastics, it is now admitted to be the only rational method of treatment.*

Kindred to exhaustion is pain.

Let us consider whether we are able by massage to dissipate it; or, at any rate, to greatly relieve it. I won't attempt to define pain. Happy are those who have never personally experienced it. As one example of it, let us take a case of neuralgia—pain in a nerve—and that very common form, sciatica, pain in the sciatic nerve and its branches—the greatest nerve in the body. Recent sciatica, and other

recent cases of neuralgic pain, are almost invariably cured by massage; and there is certainly no other means which acts so promptly and certainly. Thousands of unhappy patients have been condemned to years of pain simply because *in the beginning* this method of treatment had not been adopted.

The following is a typical case:—The patient, twenty-three years old, was brought to the hospital suffering from intense *sciatica*. Examination showed numerous painful spots along the course of the sciatic nerve, and also in the popliteal space. The pains are most severe at night, but are never entirely absent, *and walking and sitting are both impossible.* After sixteen days' massage treatment, the patient was entirely cured.

By massage and medical gymnastics and electricity, rheumatic arthritis, which is characterized by almost unbearable pain confined to the joint, and not following the course of the nerves of the limbs as in true neuralgia, is greatly benefited. The joints most frequently affected are the hip and knee joints. The articular cartilages should be gently manipulated, gradually increasing the power to as great an extent as the patient can bear; and the soft parts in the neighbourhood of the joint should be massaged by deep kneading. And when sufficient progress towards recovery has been made, the patient himself must execute movements, firstly by force of will, and afterwards by the aid of gymnastic apparatus as before described.

A "sprain" has been defined to be "the forced excursion of a joint beyond its normal limit of movement;" and any one who is desirous of curing it by massage in a few days, instead of by rest in from two to four weeks as formerly, must be well acquainted with the natural position of the joint and its natural movements. Dr. Berenger-Ferand, an old army surgeon, gives an account of 400 sprains which he treated successfully by means of massage. He classifies them as slight, medium, intense, and complicated; and his conclusion is that the nearer the massage is used to the time of the accident, the sooner is the recovery. A sitting ought to last until all feelings of distress and pain have disappeared. Numerous German surgeons have borne similar testimony. Dr. Gassner quotes twenty-four cases, whose average stay in hospital until they were perfectly well was $8\frac{1}{3}$ days, while the average stay of thirteen cases treated by rest and immobility was 28 days.*

Joints that are so tender and swollen that they do not admit of massage being directly applied to them, may be approached by commencing upon the healthy tissue some distance above them and nearer the trunk; and the healthy tissues beyond the joint should also be similarly treated, as the circulation is hindered in getting to and from them. Besides the soothing effect of this, which gradually enables us

* Graham, op. cit., p. 214.

to encroach upon painful tissues, the circulation is pushed along more quickly, so that exudations are carried off more easily.

In the treatment of all varieties of paralysis, especially when, as is often the case, pain is present, the different methods of massage, electricity, and local bathing should be conjoined. Why does electricity help paralysis? Professor Erb explains it as follows:—"An electric or any other powerful stimulus applied to a motor tract, is capable of overcoming those pathological resistances which exist in the pathway of the stimulus, and of thus forcing as it were a channel for the conduction of motor impulses to the muscles. The obstruction which volition alone was unable to overcome having been removed by force, the impulses of the will are now free to travel along their wonted paths again, and, as a consequence, mobility, though perhaps incomplete, returns."*

In reference to this subject, I wrote fifteen years ago†:—"We should endeavour, in the words of that Nestor of modern medicine, Sir Thomas Watson, to preserve the muscular part of the locomotive apparatus in a state of health and readiness, until peradventure that part of the brain from which volition proceeds, having recovered its functions, or the road by which its messages travel having been

* Schreiber, op. cit., p. 180.

† Tibbits: "How to Use a Galvanic Battery," p. 87. London: Churchill.

repaired, the influence of the will shall again reach and reanimate the palsied limbs." And I quoted the following case (under my own care) as an illustration :—"A lady, forty-one years of age, had suffered from right hemiplegia for eighteen months, and described her condition as having remained without improvement for the past six months. She had recovered sufficiently to walk with the aid of a stick, but the movements of the arm were very weak, especially those of the deltoid, extensors of the fingers, and individual muscles of the hand. Faradic contractility was somewhat lowered, but there was no rigidity. The muscles were carefully faradized with a current just sufficiently strong to produce their contraction. The entire application occupied about fifteen minutes, and was made once daily. After a fortnight's electrization she was able to raise the arm to a right angle with the body, *and to use the hand to feed herself*, neither of which she had been able to do before treatment." But in cases of paralysis it is of the greatest importance that the patient should practise *difficult* movements. Sometimes, after making hardly any progress, the ability to execute the movement will be rapidly acquired. An analogous experience is sometimes seen in health, as, for example, when learning to ride a bicycle; for perhaps the first week, not the slightest progress is made, the rider not being able to stay on the machine for a single revolution of the wheel; then on attempting it again, one may find

the new movement is suddenly acquired, and be able to ride without any effort.

I mentioned in my introductory Lecture that the massage of the Romans was occasionally used as a means for the improvement of the human form; and Graham quotes its remarkable effect upon the skin, and the expression of the countenance. He says this was well shown in a lady, fifty years of age, upon whom the marks of time were apparent in moderate wrinkles. After four months' massage for a muscular affection, she looked immensely younger, and upon Graham telling her so, she replied, "You are the third person who has told me so to-day." This is one of the general effects of massage, which is simply an expression of renewed vigour and improved general health. The physician should occasionally superintend the massage personally, for it often encourages a patient to see that the doctor takes enough interest in his case to take care that his directions are carefully followed; and in performing active movements, it is always well to set the patient a definite task. If he is ordered to raise and lower the arm as high as a certain mark, the effect produced will be entirely different from giving him a general order to merely raise and lower the limb.

In constitutional diseases of debility, such as consumption (pulmonary phthisis), diabetes, chlorosis, and their allies, massage and electrical treatment is often of marked benefit; as also in convalescence from

fevers, the weakness of advancing age, and all other conditions of debility. The muscles being the chief site of chemical change, stimulating them and their blood and nerve supply leads to increased oxygenation of the blood; to greater combustion of oxygen and elimination of waste products; to a greater desire for food; to better digestion; to production of more and better blood; to improved nourishment of the nervous system; to an increase both in number and strength of the muscular fibres; to the endowment of the whole body with vigour and elasticity; and to a consequent revival of all the mental and bodily faculties. Many young men and women fall an early prey to consumption, largely because rest and quiet have been preached, instead of urging them so to strengthen their systems by active exercises as to combat the disease.

In that troublesome disease chorea, or St. Vitus's dance, massage and static electrization should always be used in conjunction with regulated exercises.

In mild cases a methodical "drilling" of the muscles sometimes is sufficient. Laisné proceeds as follows:—He places the child before him, steadying it between his knees, then takes its hands in his, and performs movements with each arm, keeping time by counting out loud "one," "two," "three;" the child being urged at the same time *to try and keep time also with the movements and not to make them irregularly.* When the arms have been exercised, similar movements are undertaken with the legs.

From time to time a pause for rest is made, during which the limbs must be held firmly enough to prevent the occurrences of involuntary movements. Then massage the spine carefully. In severe cases the treatment should be carried out twice daily. Laisné concludes as follows :—

1. None of the means hitherto employed against chorea can show such uniform success as massage and gymnastics.

2. The treatment is applicable to almost all cases, whereas the medical very often is not.

3. With the arrest of the disordered movements, the general health of the child markedly improves, so that not only the chorea, but the accompanying anæmia is cured as well.*

Muscles that are used continuously many hours daily for one particular movement, are liable to become, after a time, unable to execute it, while there is no paralysis or loss of general power in these muscles. Writer's cramp, or "scrivener's palsy," is perhaps the most common of these affections, as writers are so many, and often write for so many hours daily; but piano and violin players, compositors, sempstresses, and other similar cases are not seldom met with. These patients may frequently be cured by the combined treatment of massage and voltaic electricity (the "constant current" only). In most cases the entire forearm and hand should

* Laisné: "Applications de la Gymnastique à la guérison de quelques maladies." Paris. 1865.

be thoroughly massaged, and the hand immersed in water with the negative pole, the positive pole being applied to the nape of the neck, both poles stationary.

Another painful affection often relieved is spasmodic torticollis or wry-neck. The muscles affected, the sterno-mastoid and trapezius, should first be gently effleuraged, then deeply kneaded; and then movements of the head backwards and forwards, and from side to side, should be made, partly by the operator, and partly by the patient.

Some German specialists have recommended massage for diseases of the eye, and Donders mentions a patient who for twenty years had been subject to periodical attacks of inflammation of the eyes, but who was entirely cured by massage. Pagenstecher found it useful in chronic inflammations, and in some cases of cataract the removal of the opacity was promoted by its employment.

Every physician should himself practise massage. He would be fully indemnified for his time and trouble in the improvement of his *tactus eruditus*, which would enable him to appreciate the changes in the tissues brought about by massage, and this would often be a new and interesting field of observation to him, for those skilled in the art come to acquire a kind of tact that enables them to graduate the touch and force to the wants of different cases: and in this conjunction I would again impress upon you that all massage should begin moderately, be gradually in-

creased in force and frequency, and should end as gradually as it began: while as to its duration it will depend upon the age of the patient; upon the previous length of the illness; upon the extent of the disease, *and upon the personal* peculiarity of the patient. In most cases the treatment should not be undertaken at all unless the patient will consent to undergo it for a period of from six to eight weeks, and with sensitive patients it is necessary to proceed very cautiously and gently at first.

These Lectures have been *only a sketch*, and I fear a most imperfect sketch, of methods of treatment of great utility—methods, the knowledge of which is daily becoming more essential to every practitioner of medicine or surgery; and methods which, on account of the time taken up, *must* be committed under medical supervision to suitably trained assistants.

I observe that a "Massage Institution," upon an enormous scale, is about to be opened upon the Continent, but although "no man is a prophet in his own country," it *does* seem to me little to the credit of English medicine, if it should be found necessary to send our patients abroad for massage and electrical treatment.

The *theory* of our treatment is, as you know, the mere "*skeleton*"—the "*dry bones;*" but I do sincerely hope and trust that you have all seen that our framework became clothed with flesh, and had breathed into it the breath of life, when, as in our daily and

practical application of the principles I have endeavoured to place clearly before you, we succeeded; if not, as we always desire to succeed in curing, at any rate, in greatly alleviating the sufferings of the many poor patients who daily crowded our hospital waiting-rooms.

In conclusion, I would for a moment ask your attention to some very kindly remarks made by a lady physician, Mrs. Anna Kingsford, who possesses one of the highest medical degrees obtainable anywhere, the M.D. of Paris. "Life," said Dr. Anna Kingsford, "is often very hard for educated women. Hard, not only because marriage is impossible for all, and because provision is not always made by parents for the support of their single daughters, but because also women, as well as men, have energies that require exercise, and laudable cravings after occupation which ought not to be repressed. It is therefore very pleasant to think medical science has opened a new door to our sex, and that ladies who do not care to face the severe toils necessary to become physicians and surgeons, or the prolonged discipline to which hospital nurses are subjected, may now qualify as *Masseuses* and *Electricians* at the new special School, founded for the purpose, in connection with the West-end Hospital, where there is every guarantee that students will receive the best possible instruction.

"As a medical practitioner myself, I am particularly glad to welcome this new departure. Convinced as I am that in the science of the future

hygiene and its practical applications are destined to take a foremost place, I am delighted to see public encouragement thus given to the spread of a method of treatment so eminently natural and 'common sense.' Drugs have too long held undisputed sway in the sick-room, and far too little attention has been accorded to the potent influence upon health which may be wielded by the expert hand of the *Masseuse*. A fresh impulse has now been given to the system, and the demand for trained operators is growing steadily and swiftly. It will be noticed that to the old method of massage science has now added the accessory of electricity; and the teacher's own proficiency in the application of every branch of therapeutic electricity will be ample warrant that his pupils are thoroughly well taught. His care in demonstration, his clearness of instruction, and the practical development he has given to galvanism, franklinism, and faradism are widely recognized; and I am happy in this connection to be able to acknowledge my own debt of gratitude to him for the kindness with which he recently met my request for a little personal assistance in the study of electro-therapeutics. I found in him not only an able teacher, but a sympathetic champion of the claims of women to a fair field of labour beside men. He fully admitted their right to graduate as medical practitioners if they so desired, and deplored the ungenerous opposition with which their efforts in this direction had been met by the majority of his *confrères*.

"Holding such views, it is quite natural that he should have taken the initiative in providing our sex with yet another honourable vocation, and we shall all regard this kindly labour of his as among the best benefits he has been the means of conferring on the world. A fruitful channel of industry has been thus thrown open to those of us who love usefulness, desire to support ourselves honestly, and who are yet unwilling to lose caste by seeking employment in domestic or trade service. No fear need be entertained that women qualified in the new School will lack employment. As has been observed in a recently issued work: 'The treatment of diseases of the nervous system has, within the past few years, grown up into a recognized speciality. Recent investigations have cast a flood of light upon its study, and it possesses, as a separate field of practice, special hospitals, and a voluminous and rapidly extending literature.' I may venture to add to this, on my own account, and as the result of my own medical observation, that the province of Massage and Electrical treatment is by no means confined to nervous diseases. One of the commonest complaints of the day, indigestion, associated with constipation, yields more readily to such treatment than to any 'exhibition' of drugs. Obstinate cases, which for years have baffled all the resources of the Pharmacopœia, have, under my own eye, been cured, or at least greatly ameliorated, by a few weeks of skilled Massage treatment. What a prospect of universal

demand and continual occupation is thus discovered to the vision of the certificated student, issuing from the doors of the Hospital in Welbeck Street! Nervous and dyspeptic disorders constitute the vast majority of the ills from which the wealthy classes suffer, and paying patients in plenty may be found as soon as the new method is popularized. Meanwhile all the journals, lay and medical, are doing their best to make it known, and the future of the rising system is already assured." So says Dr. Anna Kingsford.

Now one word of my own for our School.

Most of you are aware that it was founded at the request of many medical men and to supply a much felt want. Our Medical and Surgical Staff strongly supported the proposal, and our Committee of Management gave their sanction to it, upon the distinct understanding that it should be entirely self-supporting, and that none of the funds of the hospital should be apportioned to it; and in their Annual Report, just issued, our Medical and Surgical Staff, after describing our system of treatment, add :— "As all these methods take time, it would be impossible to conduct them without the aid of many ladies who kindly give their gratuitous services to the hospital, and who attend daily and carry out the directions of the Medical Staff."* Our School,

* See the Report for 1886–7 of the West-end Hospital for Diseases of the Nervous System, Paralysis and Epilepsy, 73 Welbeck Street, London, W.

as I have already said, *has* prospered, *is* prospering, and will continue to prosper; and in bidding farewell to those of you who have finished your course of instruction and received your certificates, I am reminded of an address delivered at the largest hospital in London, when I was a student many years ago: and I will say to you what was then said to me by the present President of the College of Surgeons. "Our hospital," said Mr. Savory, speaking of St. Bartholomew's, "is not limited to these walls. Its students, wherever they go, are part of it. Their success is its success: their failure its failure: their honour its honour: their disgrace its disgrace. Strive then to be worthy of your hospital."

Need I add, that I am sure I express our heartfelt wish when I say how earnestly we hope that every possible happiness, prosperity, and success may attend you in your new vocation: whether you make it your life-long work, or whether you may follow it only until, peradventure, fate may call you to other duties and pleasures.

And now, good-bye. I wish you a very happy holiday, and I shall be glad to see you ALL (past students and present students) back again at the beginning of our next Session.

POSTSCRIPTUM.

A SUPPLEMENTARY LECTURE.

You will recollect that in my "Electrical Demonstrations"* I discussed with you the Bones, the Muscles, and the Nervous System, the two latter subjects especially requiring our study as medical electricians.

To-day, as more particularly appertaining to Massage, I shall demonstrate the viscera in position, including the organs of the circulation, the lymphatics or absorbents, and the digestive organs.

I have had one of our life-size figures† photographed and engraved (*see frontispiece*), and I think it will help you in recalling to mind the subject of this Lecture.

THE CIRCULATION OF THE BLOOD, AND THE LYMPHATICS AND ABSORBENTS.

In the lowest animals the nutritive fluid merely percolates through the intervals between their tissues.

* "Electrical and Anatomical Demonstrations." With 45 Illustrations. J. & A. Churchill.

† The Illustrations employed were the admirable life-size figures (by Professor Marshall) of the School of Science and Art, South Kensington, and the very beautiful life-size plates from dissections by Ellis & Ford.

They have no separate tubes or vessels to contain that fluid, and may thus be said to have no proper organs of circulation. In the larger number of animals there exist tubes for the conveyance of the blood; and as a first step towards the formation of a heart some of the larger vessels contract and propel the blood into the smaller ones. This is the case in star-fishes, worms and insects. In many invertebrate animals—lobsters, crabs, and spiders—there is a heart, or muscular organ, situated in the centre of the circulating system and propelling the blood. In all the vertebrate animals, from fishes to man, the heart becomes relatively larger and more perfect. By the contractions of its muscular walls it forces the blood along a set of vessels leading from it, and branching out into all parts of the body. From the terminal branches of these vessels the blood passes through a fine vascular network, composed of a multitude of microscopic blood-vessels, situated in the various tissues and organs. From these, again, it enters a third set of vessels, which, commencing by fine branches and joining together in their course into larger and larger ones, convey the blood back into the heart again. This passage of the blood from the heart, through the body and back to the heart again, is called the "*circulation of the blood.*" The vessels leading from the heart are called "*Arteries;*" those forming the microscopic network "*Capillaries;*" and those returning the blood to the heart "*Veins.*" Circumscribed by the walls of the heart and by the

coats of these three sets of vessels, the blood does not escape from them as blood, excepting in the event of injury or disease.

In fishes, which breathe by gills, the heart consists of two hollow parts or cavities with muscular walls. One called the "*auricle*" receives the blood returned by the veins, and by contracting propels it into another hollow part called the "*ventricle*," which in its turn contracting, forces the blood through the gills along a complete system of vessels which end in a large single vessel, the "*aorta*," the branches of which penetrate the whole body; and by the veins the blood is returned to the auricle again. This is called a single circulation, because the blood starting from the heart passes through the respiratory organs, and then on through the rest of the body before it returns to the heart again; or, in other words, the respiratory circulation is part of the general circle in which the blood flows from the heart round to the heart again. But in animals which breathe the air by means of lungs, the arrangement is different, for in them the respiratory circulation ceases to be merely a part of the general one. One portion of blood is propelled from the heart to the lungs, and then comes back to the heart again, while another portion is distributed directly to the body, and thence comes back to the heart also. This is called a "*double*" circulation, and its most complete form necessitates the existence of one auricle and one ventricle for each circulation—a double heart, in

fact; and in warm-blooded animals, mammalia and man, the heart is so formed, each ventricle giving off its proper artery—the right, the "*Pulmonary Artery;*" the left, the "*Aorta.*"

The course of the circulation is as follows:—

The blood returning *deteriorated* from all parts of the body is poured into the right *auricle* by the *superior vena cava*, *the inferior vena cava*, and a small vein, the *coronary* vein, which returns the blood from the walls of the heart itself. From the right auricle it is propelled into the *right ventricle*, and by it driven on through the *pulmonary artery* and its right and left branches, into the two lungs. In the capillaries of the lungs the deteriorated blood exchanges carbonic acid for the oxygen of the air, becomes of a bright red colour, and regains its vivifying qualities. Then returning by the *pulmonary veins* into the left *auricle*, it is propelled into the left ventricle, and is then forced by that ventricle through the *aorta* and its various branches into all parts of the body. In passing through the capillaries of the various organs and tissues, the blood parts with nutritive material, expends its vivifying properties, and now containing more carbonic acid and less oxygen, and receiving into its current, by absorption, certain used-up and waste materials from the tissues, becomes changed from a bright to a dark red colour, and thus deteriorated, returns to the right auricle again—thence to pursue a similar course to that I have just traced.

The *heart* is about the size of a closed fist—a woman's heart of *her* closed fist, a man's of *his;* so that women cannot be said, "anatomically," to be larger-hearted than men! As I said before, it is a double heart; really two separate hearts joined together for convenience of space and economy of material, *for nothing is ever wasted in Nature!* It is completely divided internally into a right and a left half—that is, a right and a left heart; and by this arrangement the parting wall between the two serves as one side of *each! This is an economy of material.* The auricle and ventricle of each half communicate freely with one another, but not with those of the opposite side. The work of the auricles being merely to receive the blood and propel it into the ventricles, their muscular walls are thin; but the ventricles which have to force the blood out from the heart, through the lungs or the body, have muscular walls of considerable thickness. At every beat of the heart, the two auricles contract; and then quickly afterwards the two ventricles, the two auricles acting together, and the two ventricles together, the contraction of both kinds of cavities being called their "*systole,*" while their dilatation is called their "*diastole.*"

The number of times the heart beats in a minute may be counted by the pulse, which is on an average from 70 to 75 per minute in an adult: in the infant it is much quicker—from 100 to 120. In old age it is less, averaging from 56 to 65.

At every beat a certain portion of dark blood goes from the right side of the heart from the lungs, and having become red, returns to the left side; whilst at the same time a corresponding portion of bright red blood goes from the left side through the body, and having become dark, returns to the right side. The blood which leaves one side of the heart returns, therefore, to the opposite side of that organ: or, in other words, the two circulations—the lesser and the greater—end one in the other at the heart; and thus all the blood in the body passes in continuous rotation through both circulations.

Since both arteries and veins are connected with the heart, why is it that the blood is moved along these two sets of vessels in opposite directions?

This is accomplished by means of internal flaps or valves; some in the ventricles of the heart, others at the entrance of the pulmonary artery and aorta.

At the mouth of the inferior vena cava there is a valve called the *Eustachian* valve, which, during the contraction of the auricle, prevents the blood passing down. At the mouth of the superior vena cava there is no valve, the weight of the column of blood offering sufficient resistance.

When fully distended, the ventricle contracts powerfully upon its contents, and a triangular fold of membrane, the "*tricuspid valve*," comes into play, and extends across the right auriculo-ventricular

opening, and prevents the blood making its way back into the auricle. Hence, taking the direction of least resistance, the stream of blood is driven into the pulmonary artery, and so into the lungs. The right ventricle now ceases to contract; but the blood is prevented from returning by another valve —the "*semilunar*" valve—at the orifice of the pulmonary artery. In the meantime the ventricle, having become relaxed and dilated, is refilled from the again contracting auricle, which in its turn has regained a supply of blood from the two venæ cavæ. The distended ventricle once more contracts, and the same process is repeated at every beat of the heart.

While the right side of the heart is thus receiving successive portions of dark blood and is transmitting them to the lungs, the left side of the heart is receiving similar portions from the lungs, and is transmitting them to the body.

Now the valves on the left side of the heart correspond in arrangement and action with those of the right side.

At the left auriculo-ventricular opening there is a valve—the "*bicuspid;*" and at the commencement of the aorta are three pocket-shaped or "*semilunar valves.*" You will observe how much thicker and stronger are the muscular walls of the left ventricle than those of the right; for the left ventricle has to force the blood through the *entire body*, while the right ventricle has to force it only through the lungs.

The *arteries* are the vessels through which the blood is driven by the heart into all parts of the body. They commence by two great trunks, one proceeding from each ventricle. The trunk proceeding from the right ventricle is the "*pulmonary artery;*" the one from the left ventricle is the "*aorta,*" by which the blood is conveyed to all parts of the body. *The various arteries correspond with the various nerves.* From the main trunks of the arterial system, very numerous branches of different sizes are continually given off, which again divide and subdivide many times in succession as they run through the various tissues and organs of the body. Continually subdividing, they become so small that they require a magnifying glass to recognize them; and they pass gradually into the "*capillaries.*" The capillaries may be said to be intermediate between the ending of the arteries and the beginning of the veins, for the veins, commencing by little twigs from the capillary network, join together to form larger and larger branches, terminating at length in the large veins which empty themselves into the auricles; but the blood returned from the stomach and the intestines, before returning to the heart performs another circulation through the substance of the liver. This is called the "*portal circulation.*" The coats of the veins are much thinner than those of the arteries, and, as you know, they contain valves in their interiors; and the discovery of these valves furnished the most important hint towards

the demonstration of the true course of the blood by our illustrious countryman—Harvey.

And now having briefly considered the mechanism of the circulation—*why* does the heart, sometimes for upwards of a century, continue its unremitting work? *We cannot answer that question.* We only know that the heart is stimulated to contract by the presence of the blood, and it is a most wonderful fact that venous or dark blood only will stimulate the *right* auricle, and arterial or scarlet blood the *left* auricle; and that when (as has occurred by accident or disease) arterial blood has taken the place of venous, or venous the place of arterial, the heart has become instantly paralysed, death ensuing at once.

DIGESTION AND ABSORPTION.

The simplest form of a digestive apparatus consists of a *sac* formed in the interior of the animal, and having a single opening serving both as inlet and outlet. The stomach, with all of us, has what is called a mucous membrane, and which is really a continuation of the skin. In the simplest form of animal this lining membrane is so identical in character with its skin, that the animal can be turned inside out, the outside skin then forming the lining of the stomach, without interfering in the slightest degree with its digestion, which goes on just the same. In these dyspeptic days, it would seem a pity that the same sort of thing cannot be done with some of us!

There is another sort of animal that dispenses with any stomach at all, and when it is hungry it simply wraps itself around the food it fancies, absorbs the nutriment from it, and then disengages itself! In a higher form of animal the stomach consists of a tube; the food entering at one end, the indigestible matter escaping from the other; and by numerous gradations from this simple form, step by step, we reach the complicated apparatus found in the higher animals and in man.

Let us shortly consider digestion in these higher animals.

The food entering the mouth is more or less bruised or torn by the teeth. This is "*Mastication.*" It is also moistened by the "*Saliva.*" From the mouth it is conveyed by muscular power through the throat and gullet, into the "*Stomach.*" This is "*Swallowing* or *Deglutition.*" In the stomach it is arrested for a time and submitted to the action of the "*Gastric juice.*" This is "*Digestion.*" The substances capable of being acted upon are dissolved, and converted into a pulpy substance called "*Chyme.*" Passing now out of the stomach into the succeeding part of the tube, the intestinal canals, or intestines, the chyme becomes mixed with the *bile*, secreted by the liver, and with the *pancreatic juice* formed by the pancreas or sweet-bread; and from this mixture there results, among other products, the white milky-looking emulsion named *Chyle.* This, the final stage of the process, is

called "*Chylification.*" The chyle is absorbed by the *lacteal vessels* of the small intestines, and conveyed by the thoracic duct into the blood. The residual mass, together with certain intestinal fluids, passes along the great intestine, and is expelled as unfit for absorption into the system.

Let us shortly consider the *Lymphatic or Absorbent Vessels*, the *Thoracic Duct*, and certain roundish bodies connected with them and called *Lymphatic Glands*. These constitute the lymphatic or absorbent system.

The coats of the lymphatics are so thin and the fluid which they convey is (except during digestion) so transparent and colourless, that they are invisible in ordinary dissection. The lymphatics—like arteries, veins, and nerves—are two sets, the *superficial* and the *deep*. Commencing everywhere by exceedingly delicate vessels, they gradually unite to form larger and larger ones. The *superficial lymphatics* of the lower limbs and the lower half of the trunk run towards the groins; those of the upper limbs towards the armpits; those of the head and neck descend on each side to the root of the neck; while lastly, those of the upper part of the trunk or the thorax run, some towards the armpits, some upwards to the root of the neck. The superficial lymphatics become connected in certain situations with a great number of the rounded bodies called *lymphatic glands*. In the lower limb, for example, these are found in the *popliteal space*, on the inner side of the thigh, in the

groin, &c.: in the upper limb on the inner side, beginning just above the elbow, along the arm, and especially about the armpit. The deep lymphatics, having joined with the superficial, pass into the interior of the body in company with the principal blood-vessels. Those of the lower limbs ascend along the iliac arteries and veins, afterwards along the aorta, and they finally reach and end in the great trunk of the lymphatic system—the *Thoracic Duct.* The lymphatics of the intestines absorb the *chyle* and convey it into this duct. This fluid, as I have already said, is of a milky colour, and hence these lymphatics are called *lacteals* (from the Latin word "*lac*," milk). The lower end of the thoracic duct which receives this fluid is called the "*receptaculum chyli*," or receptacle of the chyle. The thoracic duct commences upon the second lumbar vertebra and therefore in the abdomen, but soon passing through the same opening in the diaphragm as the aorta, it ascends near that vessel, quite through the thorax (hence its name), and, resting on the vertebral column, it finally, having reached the left side of the root of the neck, behind the great veins, bends down again and opens into the point of junction of the great veins of the neck and upper limb, called the left jugular and left subclavian veins, so as to pour its contents into the venous current as it is pursuing its way to the right side of the heart. There is a smaller duct—the "*right lymphatic duct*"—receiving the lymphatics of the right half of the body, and

terminating in the angle formed by the right jugular and right subclavian veins.

The "Glands" through which the lymphatics pass are firm rounded or oval bodies, varying from the size of a hemp-seed to that of an almond, and surrounded by a strong investing membrane, and abundantly supplied with small blood-vessels. The lymphatics, like the veins, have valves, and although the causes of the onward movement of the chyle or lymph are not well understood, their coats are provided with involuntary muscular fibres; and probably by the contraction of these fibres the lymph is forced onwards, the valves allowing it only to move in one direction.

The office of the lymphatics is then to *absorb*, *convey*, *elaborate*, and empty into the venous system nutritive materials.

The office of the *lymphatic glands* is to prepare for entrance into the blood the lymph and chyle which pass through them. In certain cases in which glands are said to be sympathetically inflamed they become enlarged, and may even suppurate or form abscesses. Examples sometimes occur in the glands of the armpit from a whitlow or other sore upon the hand; and so on in all other regions. You know that the glands of the neck in unhealthy children are a favourite seat of scrofulous deposit and enlargement.

The lymphatics then *feed* the blood which is on its way, *exhausted by the work it has done*, to the right

side of the heart. Thence the mixture of blood and nutritive material is sent on through the great oxygenating and purifying organs—the lungs—and becomes fit to proceed through the left side of the heart, the aorta, and the arteries, to all parts of the body.

And now let us consider digestion a little more in detail.

The cavity of the mouth extends from the lips to the commencement of the throat. The sides of the mouth are formed by the cheeks: the roof by the palate: the floor by the tongue. The cheeks and lips consist of muscles, of a layer of skin outside; and of the mucous membrane within—the two membranes being continuous with and changing into one at the borders of the lips. Of course also there are found fat, glands, vessels, and nerves. Together with the cheeks, the lips—especially the lower lip—serve to retain the saliva within the mouth, an office the importance of which is proved by the distressing escape of this fluid in certain cases of paralysis. By means of these muscles the lips are enabled to seize, compress, or suck various kinds of food; and also to adapt themselves accurately to the borders of drinking vessels, and so to guide liquids on to the tongue (*and this is occasionally very important in certain paralytic affections of the throat muscles, where swallowing fluids is more difficult than swallowing solids, and the lips to a certain extent act as crutches, so to say, to the throat muscles!*) The lips and

cheeks also assist in mastication. The roof of the mouth or *palate* is partly hard, and partly soft. The hard part is formed by the bones: the soft is a fleshy curtain continuous with the hard palate, and hanging down at the back of the mouth. From its lower edge there depends a small projection, the *uvula*. The entire palate separates the mouth from the nose, and in eating or drinking prevents the food or fluid passing into that cavity.

The *tongue* is a muscular organ attached to the lower jawbone, and supported below by a small bone —the *hyoid bone*. In drinking it guides the liquid in the direction of the throat. It assists in mastication, rolling the food over and over. The mucous membrane of the mouth possesses glands which secrete the mucus which moistens the mouth. The glands which secrete the saliva are the *parotid gland*, the *sub-maxillary gland*, and the *sub-lingual*, of which the *parotid* is by far the largest. The saliva secreted by these six glands (three on each side) flows into the mouth chiefly when taking food; and it is calculated that more than a quart is secreted during the twenty-four hours. Even the *sight* of food will sometimes "make the mouth water," a remarkable instance of the ruling power of the nervous system! The province of the saliva is to moisten and cleanse the mouth, to moderate the feeling of thirst, and by moistening the food to render swallowing easy. *The teeth*, I need hardly say, are the essential organs of mastication, and they bruise and masticate the food,

and when mixed with the saliva it is swallowed. The *pharynx* is a sort of bag, wider above than below, and opening into the *gullet* or *œsophagus*. Its walls are muscular, and are called *constrictors* because they can constrict or press its sides together. The *gullet* descends through the neck and chest, close to the vertebral column, and therefore *behind* the bronchi, lungs, heart, and great blood-vessels, and, after perforating the diaphragm, ends in the stomach. Its walls are composed chiefly of involuntary muscular fibres; and, excepting when food or drink are passing down it, its sides are in contact.

The first stage of swallowing is a voluntary act. The food is propelled from the mouth to the commencement of the throat. *The second and concluding stages* are accomplished by a combination of *involuntary* movements, and chiefly by the successive contraction of the constrictor muscles upon the descending substance, until it is gradually, so to say, pushed onwards into the stomach. That "dilated pouch"—the stomach—has an upper opening from the œsophagus, and a lower opening—the *pyloric opening*—leading to the intestines. The small intestine is a smooth circular tube about twenty feet in length, and is closely packed by being doubled about upon itself, forming *convolutions* or windings. Certain portions of it receive different names. Thus the upper foot or so is called the *duodenum;* about half of the remainder is called the *jejunum;* and the last half the *ileum*. The large intestine in which the

ileum terminates measures about five feet, and becomes somewhat narrower as it proceeds. It is distinguished, not only by its exceeding the small intestine in width, but also by its course being remarkable, for it nearly surrounds, as it were, the convolutions of the small intestine. It is divided into, first, the *cæcum;* secondly, the *colon;* lastly, the terminal part, or *rectum.*

The convolutions of the small intestine occupy the middle and lower part of the abdomen, and overlap the colon.

The stomach, in which a certain quantity of food has to be accommodated for from two to three hours, to be acted on by the gastric juice, is firmly held to the diaphragm by the œsophagus at one end, and to the back of the abdomen by the duodenum at the other. Its middle part is more free, so that it is tilted upwards and forwards as it becomes filled, and falls back and down again as it is emptied.

All the parts I have mentioned are held in position within the abdomen by attachments of various muscular and nervous tissues, and especially by a thin, smooth, and transparent membrane called the *peritonæum.* The abdominal muscles also largely assist in supporting the contained organs.

The stomach possesses a muscular coat. During digestion it undergoes a remarkable series of slow contractions of a wave-like character, passing in regular succession along it, from its upper to its lower end. These are called peristaltic movements,

and they are involuntary movements excited by the presence of the food, for they cease when the stomach is empty. Under ordinary circumstances they are *not* accompanied by sensation; but we all know that with indigestion matters may be very much altered in this respect.

By these movements the partially digested food is gradually passed on into the commencement of the small intestines—the *duodenum*—and thence onward, until finally the non-nutritious portion is expelled from the body.

The stomach is supplied with numerous little tubes like little flasks, opening at one end into the stomach, but closed at the other end. These *gastric glands* or *follicles* secrete the *gastric juice* in very large quantities—as much during digestion as a pint in an hour, and therefore several pints daily. It is a somewhat acid fluid, containing a peculiar animal substance called *pepsin*, and which causes the rapid solution of such compounds as albumen, fibrin, gluten, gelatine, &c.

When the partly digested food passes into the duodenum it receives the admixture of bile and pancreatic juice; and that leads us to a consideration of the *liver, with the gall-bladder, and the pancreas.*

The *liver* is a large, firm, reddish-brown organ placed in the upper part of the abdominal cavity, in front of the aorta and vena cava, occupying chiefly the right side, though it stretches across a little to the left side also. It weighs about four pounds in

the adult. Its upper surface fits accurately into the arch of the diaphragm above, while its under surface rests upon the stomach and duodenum. By ligaments it is connected firmly with the diaphragm; it ascends and descends with that muscle during inspiration and expiration, as well as undergoing slight changes according to the attitude of the body; but no "dragging" takes place: for the liver is supported by the muscular walls of the abdomen.

The substance of the liver consists of an innumerable number of little masses, about the size of pins' heads, which are held together by the finest blood-vessels, and there is nothing more remarkable than the circulation of the blood through the liver, because it is exceptional in the body. It receives a small quantity of arterial blood through a branch from the aorta, but it is chiefly supplied by the *portal vein with venous blood already employed in circulating through the other abdominal digestive organs.* This blood, having, as it is believed, undergone remarkable changes in the liver, finally escapes into the ascending vena cava, and so reaches the heart.

So much for the blood circulating through the liver, but during this circulation the "*bile*" is secreted, and this bile is finally poured into the commencement of the small intestine (*the duodenum*), where it mingles in company with the pancreatic juice with the chyme, descending from the stomach. Bile is secreted at the rate of about two and a half pints in twenty-four hours. It is a thin greenish-

yellow fluid; and there is no doubt that it helps to stimulate the muscular coat of the intestine to a healthy peristaltic action; but in addition to secreting bile, the liver has been proved to perform other important functions, as, for example, removing certain injurious matters from the blood.

The *gall-bladder* is a small bladder capable of holding two tablespoonsful of fluid. Its office is to receive such bile as, not being immediately required, is prevented from entering the duodenum, but flows into this temporary reservoir. If required it is propelled into the duodenum, and this is a beautiful example of *reflex action.* If *chyme* is in the duodenum and not sufficient bile, the nerves are stimulated, the gall-bladder contracts, and whatever bile it has is sent on!

The *pancreas* or *sweetbread* is a gland placed deeply in the abdomen behind the stomach. It weighs about three ounces. The fluid it secretes is somewhat similar to the saliva, and enters the duodenum by the same duct through which the bile enters.

Let us now shortly review the digestive process, which by Professor Marshall has been exhaustively recapitulated as follows:—

"*The vital mechanics of the acts of mastication and deglutition—the churning movements* given to the food as it is gently compressed by the stomach—the timely introduction of the bile and the pancreatic juice—the relative fixity and mobility of the

different parts—its lubrication throughout by a protective mucus—its curious creeping peristaltic action, ensuring the onward movements of the food, and aiding the absorption of its nutrient portions; besides and beyond all this the vital chemistry of the digestive process—the special action of the mucus, the saliva, the gastric juice, the pancreatic fluid—the intestinal juices, each yielding many ounces of fluid daily; then the twofold method of absorption, by the blood-vessels and by the lacteals —the purifying influence of the liver,—present a combination of wonderful contrivances and actions, not more perfect, but surpassing in complexity of detail the comparatively simple structure and functions of respiration and circulation."

May I personally add one sentence to this admirable summary of Professor Marshall:—You may recollect an article which when it was published made some sensation—"IS LIFE WORTH LIVING?" The answer given was—"THAT DEPENDS UPON THE LIVER!" Might we not say upon the amount of bile kept as a reserve in the gall-bladder? And mind, all joking apart, it is of *immense* importance that the functions of the liver should *always* be carefully looked after. Many a man has committed suicide because his gall-bladder did not contain a sufficient *reserve of bile;* and I think Shakespeare said something about "green jealousy," was it not? But I forget the quotation.

I must, however, say *one* word about the *spleen* (it

is called in animals the "*milt*"). It is a gland situated in contact with the left end of the stomach. It is of little practical importance. It is supposed to be a sort of safety-valve when the circulation is obstructed in the liver, but this is doubtful; and as it can be cut out of animals without their being any the worse for its loss, I think we may dismiss it with this brief acknowledgment that it exists.

INDEX.

Apostoli, Dr., 74

Bathing, 46
Baths, Massage Douche, 31
Medicated, 52
Portable Turkish, 48
Sequelæ of, 53
Battery, the Voltaic, 65
The Combined, 68
The Faradaic, 63
Bile, Secretion of, 137
Blood, the Circulation of, 119

Cell, the Leclanché, 59
Chlorosis, 109
Chorea, 110
Consumption, 109
Constipation, 80

Diabetes, 109
Diet Scale, 97
Digestive Process, Review of, 138
Digestion and Absorption, 127
Dosage of Massage, 10
Dr. Fagge, 79

Effleurage, 14
Electric Conductors, 62
Necklet, 61
Electrization in Paralysis, 107
and Nutrition, 63
Continuous, 56

Fat, Reduction of, by Massage, 101
Fatigue, 103
Fevers, 109
Friction, 12

Gall-bladder, Obstruction of, 79
German System of Massage, 16
Granville, Dr. Mortimer, 37
Greenhalgh, Dr., 80
Gull, Sir W., on Disease, 2
Gymnastics, Medical, 44

Indigestion, 116
Inhalation, 54
Inhaler, Dr. Siegle's, 54
Intussusception, 79

Ling's Movement Cure, 32
Liver, Description of, 136
Natural Massage of, 76
Lymphatics, the, 129

Massage, Definition of, 3
Complete, of body, 24
Dosage of, 10
Douche Baths, 31
Electro-, Importance of, 100
German System of, 16
in Chlorosis, 109
Chorea, 110

Massage, in Constipation, 80
Consumption, 109
Convalescence from Fevers, 109
Diabetes, 109
Exhaustion, 103
Indigestion, 116
Intussusception, 79
Neuralgia, 80
Old Age, 110
reducing Fat, 101
renewing Health, 109
Rheumatic Arthritis, 105
Sprains, 106
the Relief of Pain, 104
Torticollis, 112
Uterine Displacements, 73
Inflammation, 77
Irregularities, 73
Tumours, 73
Writer's Cramp, 111
Mental opinion on, 8
of Dog, 23
Liver, 77
the Stomach, 79
Physiology of, 70
Principal processes of, 12
Schreiber, 17
Mental Massage, 8
Mitchell-Weir, Method of, 5
Mosengeil, Experiment by, 69
Experiment of, 104

Nerve Vibration, 37
Neuralgia, 80
Neurasthenia, Cases of, 92, 93, 96, 101
Description of, 84
Diet in, 91
Treatment of, 88
Typical Diet, Scale in, 97

Obesity, 101
Old Age, 110

Pain, 104
Paralysis, 108
Case of, 108
Percuteur, the, 39
Pétrissage, 15
Pinching, 26
Practice, Importance of, 11
Pressure, 17
Principle, the Vital, 83
Physiology of Massage, 70

Reymond, Du Bois, 72
Rheumatic Arthritis, 105

Sciatica, 105
Skin, Functions of, 51
Somnambulism, 90
Spine, Curvature of, 45
Sprains, 106
Squeezing, 28
Stomach, Massage of, 79
Sympathy, Power of, 9

Tapotement, 14
Tapping, 21
Thrusting, 21
Treatment, Importance of Combinations of, 56
Tumours, Uterine, 73

Uterine displacements, 73
Inflammation, 77

Writer's Cramp, 111
Wry-neck, 112

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